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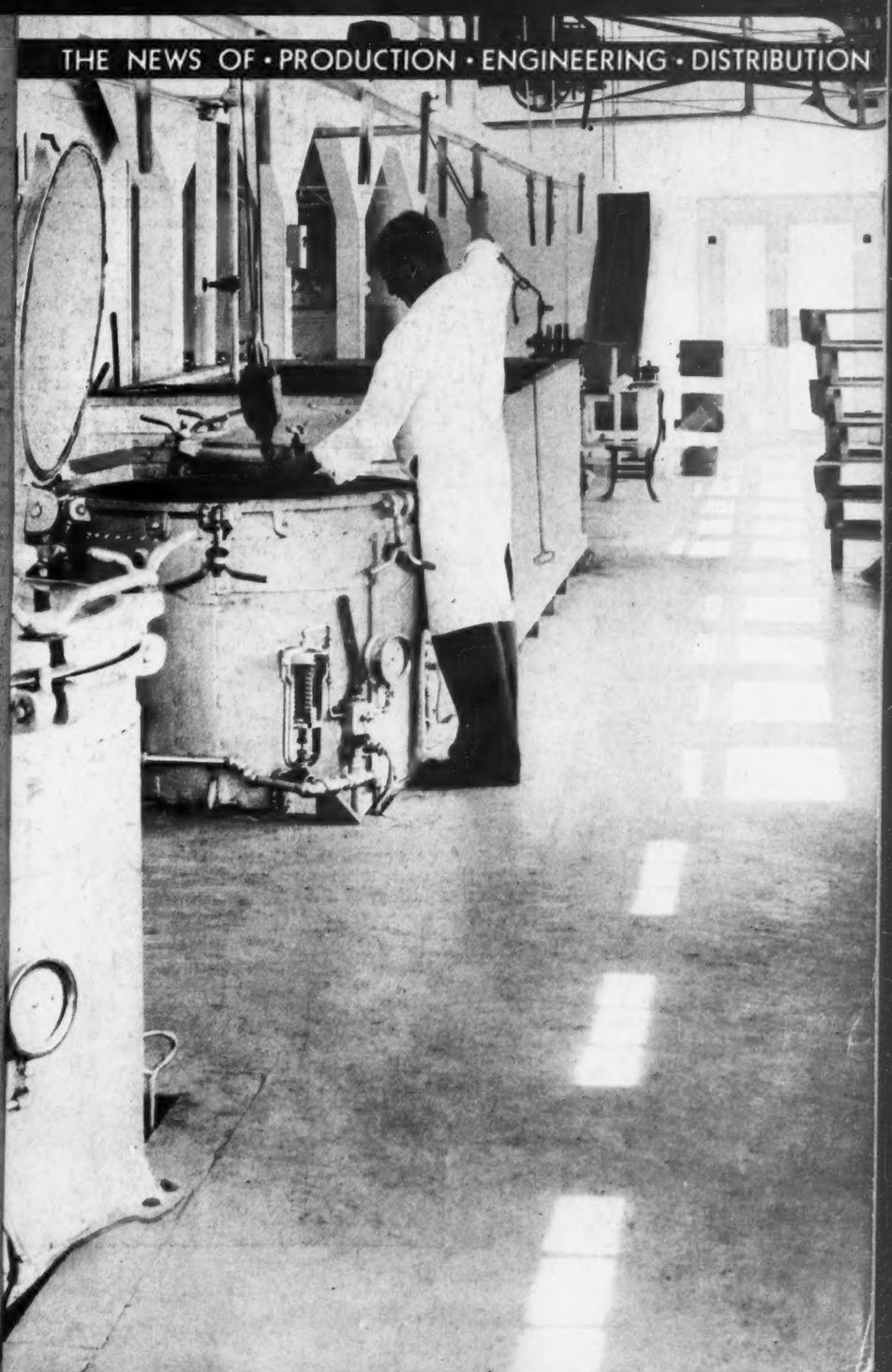
FOOD INDUSTRIES

THE NEWS OF · PRODUCTION · ENGINEERING · DISTRIBUTION



BAKERY PRODUCTS

BEVERAGES

CANNED AND PRESERVED FOODS

CONFECTIONERY AND CHOCOLATE

DAIRY PRODUCTS AND ICE CREAM

FATS AND OILS

FLOUR AND CEREAL PRODUCTS

MEATS AND MEAT PRODUCTS

OTHER FOODS AND SPECIALTIES

JANUARY, 1935

McGRAW-HILL PUBLISHING COMPANY, INC.

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CHAIN BELT COMPANY
1616 W. Bruce St., Milwaukee, Wisconsin

CHAIN BELT COMPANY

CHAIN & BELT CONVEYING

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FOOD INDUSTRIES

PRODUCTION • ENGINEERING • DISTRIBUTION

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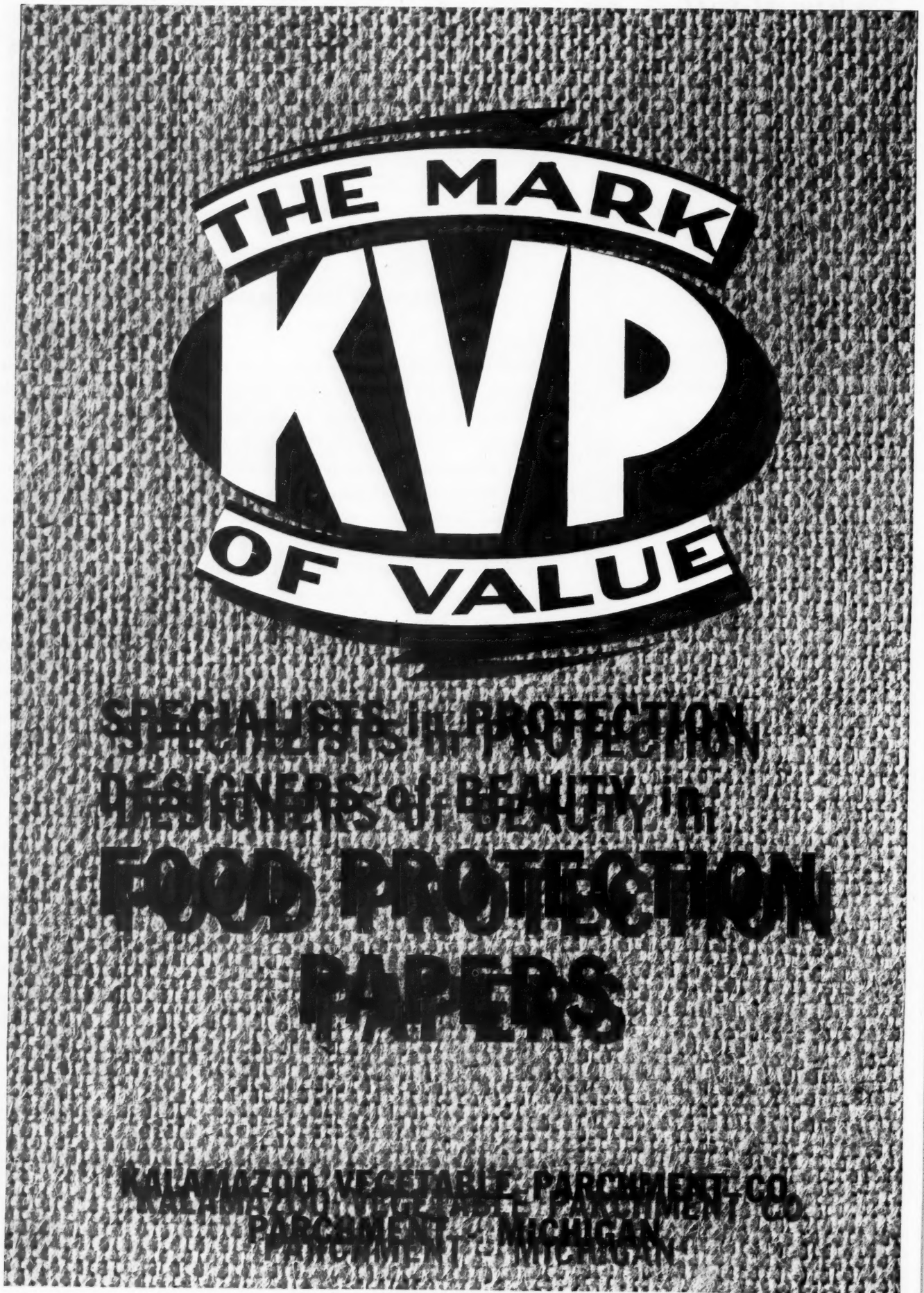
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Vol. 7, No. 1

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Laurence V. Burton, Editor

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JANUARY 1935

THE TALK OF THE INDUSTRY

AFTER we wish a prosperous New Year to you, we will confide that this year, more than in any previous year since we left the factory for the editorial chair, there have come to us requests for our year-end statement and our forecast for the coming year.

One newspaper syndicate wanted our year-end statement on December 1, which to our way of thinking, is downright cheating. There ought to to be a code "agin" it.

That anyone wants to read a year-end statement is ample testimony to the existence of that trait of human nature from which that gentle economic fiction, the consumer, demands protection. The consumer will apparently believe anything if it is in print, and so must be protected from it.

THERE is now developing, however, a new type—the professional consumer group which affords us no end of diversion. They seem to believe anything but the truth. One of them, down Philadelphia way, took us to task in the Autumn for even mentioning in FOOD INDUSTRIES some experiments in which glycerine was added to cake to improve its moisture retaining qualities. Cake, said the professional consumer, should be made only from flour, sugar, eggs, milk and butter. Glycerine! Chemcals!!!!

Probably it is a mistake to answer a professional consumer at all. Our ill-considered fondness for an argument prompted us to suggest a study of the chemistry of butter to see how much glycerine entered into its composition. But such an answer is no answer at all to a professional consumer. Nothing but half a truth will satisfy. Or perhaps a knowledge that there are no small peanut-size chemical radicals, like the glycerol radical, in their foods.

SPEAKING of year-end public statements, in case you have never written one, the procedure is simple. Each year you go, figuratively of course, to the mountain top after an unconscionable number of hours of poring over curves and statistics, calculating, speculating and plain ordinary stewing. And then behold, you produce a statement and prediction.

In case you are interested in our trip to the mountain top we present the summary of our findings minus the trimmings needed for a newspaper story.

In 1935 the tonnage of processed foods will remain about the same as

Hors D'oeuvers

• The French are converting their surplus wine into fuel for automobiles. Judging from the taste, some of the wine made in this country already so closely resembles petrol that it wouldn't have to be converted.

• *If meat packers find government regulation bothersome in America, we wonder what their brothers of the Argentine think. If the Argentine packer doesn't open his books, the jailer opens a cell.*

• "Ho! For Home and White Rose Tea." Used with the picture of a sleigh racing homeward over the wintry snow, this slogan is a welcome buying stimulant to a public long fed up with the wild claims of tea and coffee advertisers.

• *An old timer in the dairy industry got to reminiscing recently and described the ultra-modern milk wagon of 1883. In case you're interested, it comprised a cedar barrel with fancy brass hoops and a shiny brass spigot. This was driven to the consumer's door, a bell was rung, and the housewife came running with a pitcher in one hand and a dime in the other.*

• Here's an idea for truck fleet operators. An automotive specialist at the University of Michigan tells of a large company which sells new oil to its employees, drains it from their cars after 1,500 miles, filters it and uses it in commercial cars. Is this debunking frequent oil changes!

• *Goodyear finds that automobile tires broken in during cold weather wear 30 per cent longer than those put on the road in summer. Maybe it would pay food companies to roll their new tires around in the cold storage room.*

it has been in other years—about 211 billion lb.

Prices f.o.b. factory will average 10 per cent higher than 1934.

Net profits will average 5 per cent higher than 1934.

Retail prices will average 15 per cent higher.

Average food consumption will continue as usual at about 1 ton per capita per year.

Meats, the housewife's key to the choice of the other foods that will accompany it to the American dinner table, will command much higher prices from March onward. Foods which compete directly with meat *can* command commensurately higher prices. Make up your mind whether you want prices or volume.

Foods that are natural companions to certain meats like sauerkraut to spare ribs or peas to lamb or A1 sauce to roast beef or mushrooms to beef steak will have to travel with expensive company.

JUST where we are on the fluctuating curve called the Cow Cycle is not easy to determine because the normal cycle has been upset very decidedly by the drought and the government's slaughtering campaign. A new census is needed to ascertain how many cows are left to produce the milk of the nation. And even if we knew how many animals there were it would take five or six months more before we could estimate the probable amount of feed to be available.

The peak of the cow population was passed early in 1934 and we are now on the down-swing probably several years ahead of where we would have been had it not been for the drought and slaughter. A lessened volume of milk production can be anticipated in 1935, with consequently less political pressure from farmers' organizations for higher prices on the farm. Dairy companies will probably get less criticism, for natural economic forces will probably boost milk prices. The profit position of dairy companies will not be greatly enhanced thereby unless they are able to effect economies of operation. It looks like a good year for the economies possible by improved methods of fluid milk distribution.

The most serious threat arises in the South where cotton farmers have voted for continuance of the Bankhead cotton control plan. What crops will be planted on the idle land? It is reasonable to expect that the South will produce food and feed on acreage formerly in cotton. If so, then what will become of the market for Northern hay, butter, meat and canned foods?

Somewhat offsetting this disquieting thought is the effect of the tariff on Philippine coconut oil, for many margarine manufacturers are now hydrogenating cottonseed oil for use in place of coconut oil. Whether this will put enough more money into the South to permit the continued purchase of Northern products depends on the future attitude of Northern dairy producers and fine cattle breeders.

IF WE DRAW a circle around 1935 and omit consideration of the forces that may reach farther into the future, it looks as if 1935 will be as good a year as 1931 for the food industries.

Labor troubles arising out of Section 7(a) of NIRA are the biggest threat on the immediate horizon. A close second will be the problem of adjustment of employment policy and prices to the new social legislation that is certain to be enacted.

A VIEW of 1935, broader than that of the food industries alone, is the year-end statement of Malcolm Muir, president of McGraw-Hill Publishing Company, who should be better known to the readers of FOOD INDUSTRIES. From his vantage point of a half-year as a Division Administrator on NRA, and membership on the board of directors of National Association of Manufacturers and as a NAM delegate to the joint conference at White Sulphur Springs, he sees that in many respects 1934 has been a "trial and error" year, during which government, business and labor, as well as the general public have learned much about each other that should speed us on the road to recovery.

"To a great extent 1935 looms as an 'if' year. But most of the dangerous 'ifs,' as I see it, are controllable.

"First, we must have a sound program for recovery on which business and the Administration can agree and cooperate. Secondly, business must realize that even if the government does its part, there can be no recovery until there is a resumption on the part of business men of their enterprise and initiative that have characterized recoveries from other depressions. Given these two things, and a minimum of labor trouble, and three of the important 'ifs' of the year will be converted into tangible forces for recovery. Such revitalizing of private enterprise would result in an increase in employment with a proportionate decrease in federal relief expenditures, a greater distribution of perishable and durable consumer goods and, most important, the development of a firm foundation for the much needed expansion of our capital goods industries, which must precede any sound recovery.

"Specific fields of activity show much promise for the year ahead. Construction looks forward to 1935 with a definite and substantial expectation of improvement, and we are witnessing now the first rise in volume of construction that has occurred in five years.

"The national electrical energy load is now within 6 per cent of the 'prosperity' maximum, with the curve still pointing upward. A further moderate increase will call for large expenditures for the installation of new equipment. . . .

"Vast expenditures for a modernization and service improvement program, approximating $200,000,000, have been announced by the railroads. . . . The program of modernization must be extended throughout all industry, both to lower the cost of goods to consumers and to give the stimulus to the heavy durable goods industries that is necessary to effect recovery.

". . . If the psychological and political barriers to progress are removed on the one hand, and if American business will overcome any tendency to 'sit back and see what the doctor will do,' 1935 will probably earn the title of—'Recovery Year.'"

No More Headaches

WHEN Borden's Farm Products Co. of New York finally decided to abandon the company union and signed a wage agreement with a union affiliated with the American Federation of Labor, the company got rid of a problem of many years duration.

A company union is not without certain items on the debit side of the ledger, not the least of which are shop committees which must pass judgment on disciplinary matters and differences of opinion with the man-

agement. All such meetings are on company time.

Under the new method of employee representation, the union agents will be consulted who will act for the employees. Furthermore the union, not the company, will pay the agents' salaries. Employee meetings will presumably be on their own time.

One wonders whether the employees have gained or lost. We do not know just how rigid the discipline in this new union may be. There is one milk wagon drivers' union where it is most unhealthy to cross its president's will.

New Food Law

WORK on the new food law is coming along. Nearly all efforts take S. 2800 as the starting point. The situation will be entirely different this year from what it was when the Tugwell bill was introduced and the Administration failed to take industry into its confidence. Result: everybody was opposed to the bill, though some manufacturers were extremely skillful in concealing it. A good bill will require considerable cooperation for passage.

Senator Copeland has demonstrated he can walk alone politically and will probably be a Senator long after Roosevelt leaves the White House. The President "forgot" to mention Senator Copeland in November when he was naming his favorite New York state candidates. Tugwell hopes Senator Copeland will not have anything to do with the department bill. Food manufacturers are uniting with Copeland. The Senator's bill will be the one which is passed.

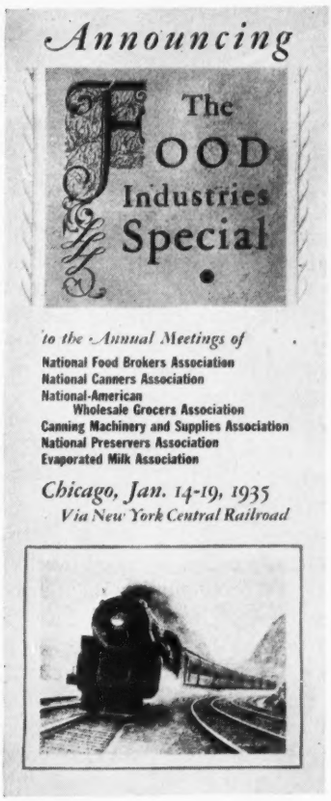
A P. and L. Statement

ONE food concern has a bill from its code authority demanding a $3,000 payment for dues, and it is not exactly in the mood to remit. For benefits accrued from the code it can point to a saving of about $1,800 arising out of a code prohibition against reverse-charge telephone calls. Increased expenses, traceable directly to the code, are an estimated $5,000 for time and expenses of executives on code work, a Section 7(a) strike that cost more than $30,000, to say nothing of permanent increases in costs of labor and supplies. And, more important, practically all the objectionable trade practices still continue in the industry except the reversal of toll charges.

Gaining Safety by Proper Venting

LAST month FOOD INDUSTRIES presented a group of striking pictures that convincingly demonstrated the effectiveness of proper venting of dust explosions in minimizing damage. The splendid work in this field of the chemical engineering division of the Bureau of Chemistry and Soils (which furnished those pictures) is available to the food industries. Wherever there is a suspicion of dust hazard, inquiry should be instituted and often the aid of the Bureau engineers should be enlisted.

Two serious explosions have occurred since those picture pages were prepared. These offer further convincing evidence, if any was needed, of the importance and the timeliness of such studies. Fortunately for most plants, good housekeeping and careful planning are the principal requisites. Large sums of money for new equipment or changed structures are usually not necessary. A penny-wise policy of ignoring possible hazard is, therefore, more than pound foolish; it may be foolish to the extent of causing loss of life.



When the New York Central Railroad names a New York to Chicago train The Food Industries Special, well, that's sump'n! Undeserved though the compliment may be, gentlemen, you have us blushing prettily, and likewise covered with confusion when we explain that, in addition to the six conventions you have listed, you should add the National Pickle Packers Association.

Unite, or Else . . . . .

ALTHOUGH some of the left wingers jeered at the manufacturers' efforts in the hitherto untried field of statesmanship, the platform for recovery emerging from the White Sulphur Springs conference is really an achievement of a sort. Many of the heads of big corporations have not learned the necessity of compromise. Some of them have always had their own way. Even today, many of them have failed to realize how far we have traveled the road called liberalism since March, 1933.

The left wing derision which greeted the conference report and its faults, both obvious and obscure, depending upon one's social views, is not to be taken too seriously. The one thing to which all top executives should hold with the grip of death is that *business must unite on some program and stick to it!* Business heretofore, has had no program but that of rugged individualism, while the left wingers have a very definite program that is leading to state capitalism, an economic system where the individual and all his activities are controlled by the state.

Business must unite, or else. . . .

"Apartment" Packages

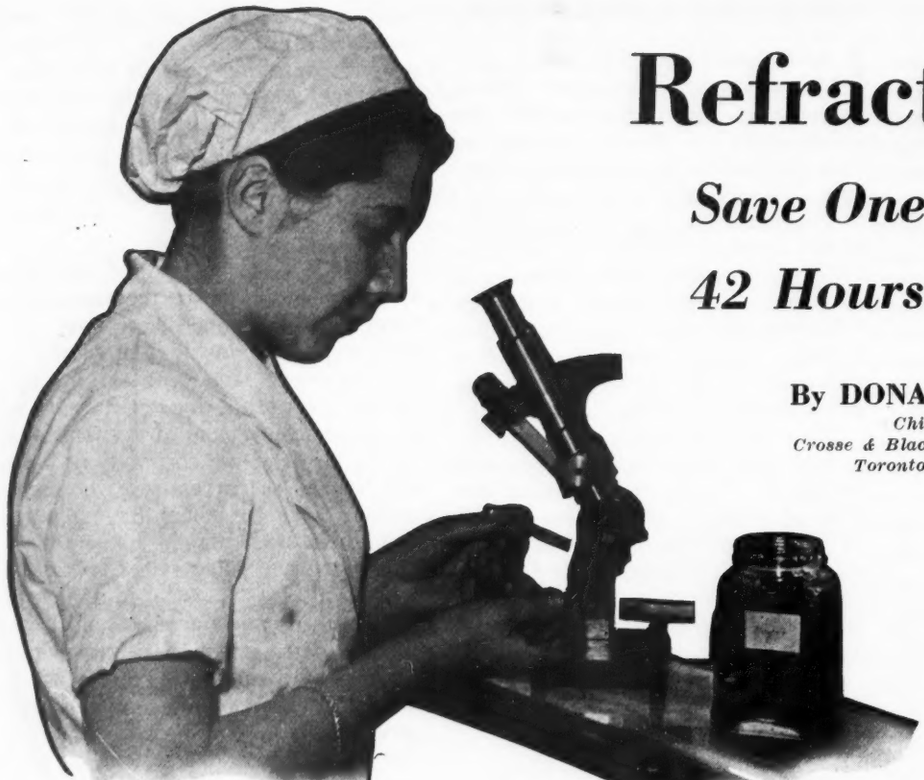
WHEN designing food packages for sale in city stores, particularly in those which cater to the small apartment dweller, it is most important to try to develop slender, vertical packages. Squat, flat packages do not appeal to the mistress of a kitchenette apartment. She wants one that is tall and occupies but little shelf area.

Be it always remembered that shelf space in an apartment pantry is at a greater premium than counter space in a 5- and 10-cent chain store. Many manufacturers using big packages are under something of a handicap for this reason. Their packages must often be stored on top of cabinets—usually out of sight. We would not say that breakfast food manufacturers would make more money by having a special shaped "apartment" package, but we believe that consumption would be greater.

Refractometers

Save One Food Plant 42 Hours Each Week

By DONALD D. McKAY
Chief Chemist,
Crosse & Blackwell (Canada) Ltd.,
Toronto, Ont., Canada.



Saves time and space. The operator smears a sample on the face of the prism, snaps it in place, and takes the readings. Simplified instruments permit the use of daylight or artificial light indifferently.

Moving this optical instrument from laboratory into plant made the saving. Preservers, canners, dairies, meat packers, oil refiners use this method profitably.

CANNERS and other food manufacturers in the United States and Canada are giving belated but well-merited attention to the refractometer, which has become a factory tool in the canning field in Europe. Improved production methods and economy of skilled time are twin advantages in the control of many food processing operations that result from moving this optical instrument from the laboratory out into the factory.

Jams and tomato products are two lines on which the refractive index gives important information about the product during manufacture, with accuracy and speed. Catsup boiling in our plant is an example of the successful use of this method in which at least two determinations of specific gravity must be made on each boil. The values were formerly determined by the pyknometer method, requiring the services of a skilled technician. This method took ten minutes for each determination, allowing for cooling of the sample, filling the gravity bottle, expelling the air by centrifuging, and weighing. The refractometer reading, in contrast, takes but three minutes and can be satisfactorily made by an intelligent girl operative.

The importance of economizing analytical time in catsup boiling is evident when it is recalled that a first-class product must be "finished" within fifteen minutes. The catsup deteriorates if the boiling is unduly prolonged. Refractometer control permits several adjustments of pulp, salt, sugar and vinegar within this time limit, widening the working range in comparison with the slower pyknometer determinations.

Weighing a pyknometer on the balance is not a procedure which can be efficiently performed amidst kettles and pipelines, but a refractometer can be employed conveniently right on the cook deck. When tomato pulp or "puree" of specified gravity is prepared for stock or storage, time is saved by not having to send samples to the laboratory. Suppose a pulp of 1.045 gravity is to be prepared. The operation requires only the boiling of the tomato juice until this gravity is reached. The juice is usually boiled down near a predetermined volume which should give the gravity desired. Next it is analyzed by the pyknometer method, and a calculation made of the volume equivalent to 1.045. The boiling is stopped when this volume has been reached. If, however, the man on the cook deck has a refractometer, he can follow the process continually, stopping it exactly at any gravity desired.

Refractometer scales can be calibrated to read directly in per cent of soluble solids. It has been found that the soluble solids content of tomato products as given by refractive index will check to within 1 per cent of the actual weight of sample obtained by vacuum drying at 70 deg. C; a correspondence close enough for any industrial purpose. The close agreement is due to the fact that sugar accounts largely for the specific gravity and the refractive index depends almost entirely on the sugar content of the material. Small deviations due to other ingredients in catsup, as salt and vinegar, will generally cancel one another.

A change in formula may raise

doubt about the interpretation of the refractometer scale readings, but the instrument can be easily calibrated. We do this by selecting a series of catsups and "purees" of different gravities. Refractive indexes are recorded and pyknometer determinations made on the same samples. Curves are drawn relating the two values, and the operatives provided with an interpolated table. The men read degrees on the instrument and then find per cent of total solids in the table.

Refractometers can be relied upon to control many processes where a definite concentration as represented by sugar or soluble solids content is desired. For dilute solutions or liquids of low viscosity it is true that the average workman can use a hydrometer, but even in these cases the refractometer saves in the amount of sample required and simplifies temperature corrections or adjustments. With materials such as jam, jelly or thick pulp, a hydrometer is useless, but a reading of refractive index can be obtained if a thin film of the sample is smeared on the prism surface.

The utility of the refractometer has been extended in recent years by the development of simple, strong instruments with few adjustments and of low cost. Modifications for the sugar and oil industries, with a measuring scale incorporated directly in the telescope field, read either in refractive index or per cent of dry substances. Portable instruments are available that can be used for checking the ripeness of standing sugar cane or of tomatoes in the field.

Meat packers use refractometers for following the hardening of fats, with readings taken right at the hydrogenating unit while the material is receiving treatment. Another use in the field of fats, is that of the butyro-refractometer for butter fat determination. While this instrument has a range limited to that required for butter fat, it can be used for determination of other soluble solids, as is the case in our jam department.

Refractometers can be mounted on a vacuum pan or pipeline, thus avoiding the necessity of extracting samples during processing. The reading then gives the per cent of water or concentration of material in process. It can be used for light or dark colored solutions such as jams, mashes, syrups or molasses.

Another modification is the dipping refractometer for aqueous, alcoholic and weak ethereal solutions, which is as simple to use as a thermometer and permits a greater magnification of the scale and hence higher accuracy than such instruments as are used for butter fat, where the liquid is between two prisms.

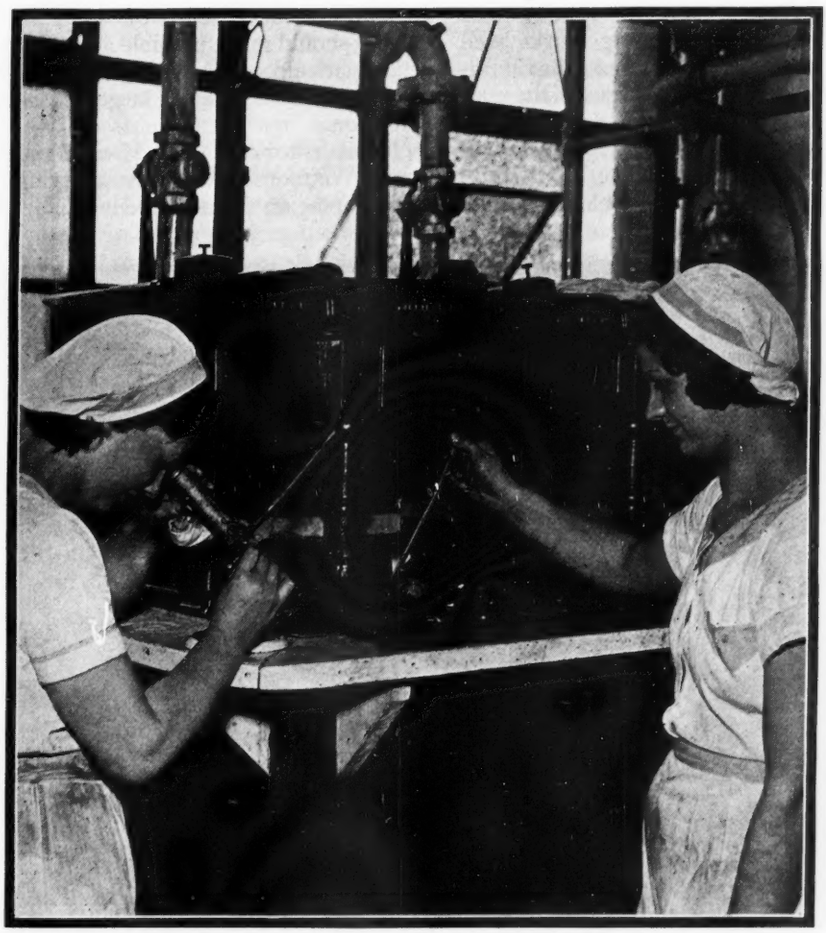
One feature of the factory refractometer is simplified illumination. The refractive index does vary to some extent with the color or wave length of light used, with the sodium vapor lamp the standard for reference work. In most factory refractometers, however, compensating prisms are used which permit the use of daylight or artificial light, and furnish readings virtually the same as those based on the sodium spectral line.

In laboratory use, the refractometer measurments must be taken at standard temperatures. In factory work, where a high degree of accuracy is not required, the temperature may be ignored, as the amount of the sample is so small that it soon comes to the temperature of the prisms, or room temperature.

Refractometers are useful in the examination of raw materials, as well as in the control of processes. Edible and essential oils, fats, syrups, fruit and vegetable pulps can be checked for adherence to specific standards. One of the butter refractometers is so constructed that, in addition to furnishing the refractive index, it also reveals adulterants.

The relatively inexpensive hand and factory refractometers are at present made in Europe, but may later be offered by an American optical concern. Details of available types and literature on refractometry are available from most of the optical instrument manufacturers.

To show prospective cash savings from the use of the refractometer in the factory, the experience of our company on catsup manufacture will serve. We average 30 catsup boils per day, meaning at least 60 determinations. The saving of seven minutes on 360 analyses each week sums up to 42 hours, equal to the entire time of one technically trained man, a short cut that returns the cost of the instrument in a few weeks.



Jam makers use the instrument in the plant. One girl pours samples on a large spot plate, where they cool. The other girl reads the refractive index and records the specific gravity of the batch.

Wrapping Cheese in Cheese

Loaf Swiss That Does Not Mold Produced by New Packing Method

By FRED C. BOWMAN
Arthur Maas Laboratories
Los Angeles, Calif.

FIVE-POUND loaves of Swiss cheese for slicing for sandwiches, retaining all the nutty flavor and the "eyes" for which this cheese is famous, have just been introduced by the Challenge Cream and Butter Association of California. This is the first time a loaf or brick of natural Swiss cheese has been developed that would not mold.

High-quality Swiss cheese can be made only in wheels of 200 lb. or more. Production in smaller sizes has always caused loss of flavor or suppression of the eyes that the consumer has learned to demand. However, these large wheels have serious drawbacks. They cannot be cut into sandwich squares without serious loss and one wheel is much too large an order for the usual retail dealer. If he buys a part of a wheel either the cut surface dries out and must be discarded or it develops mold and so causes loss.

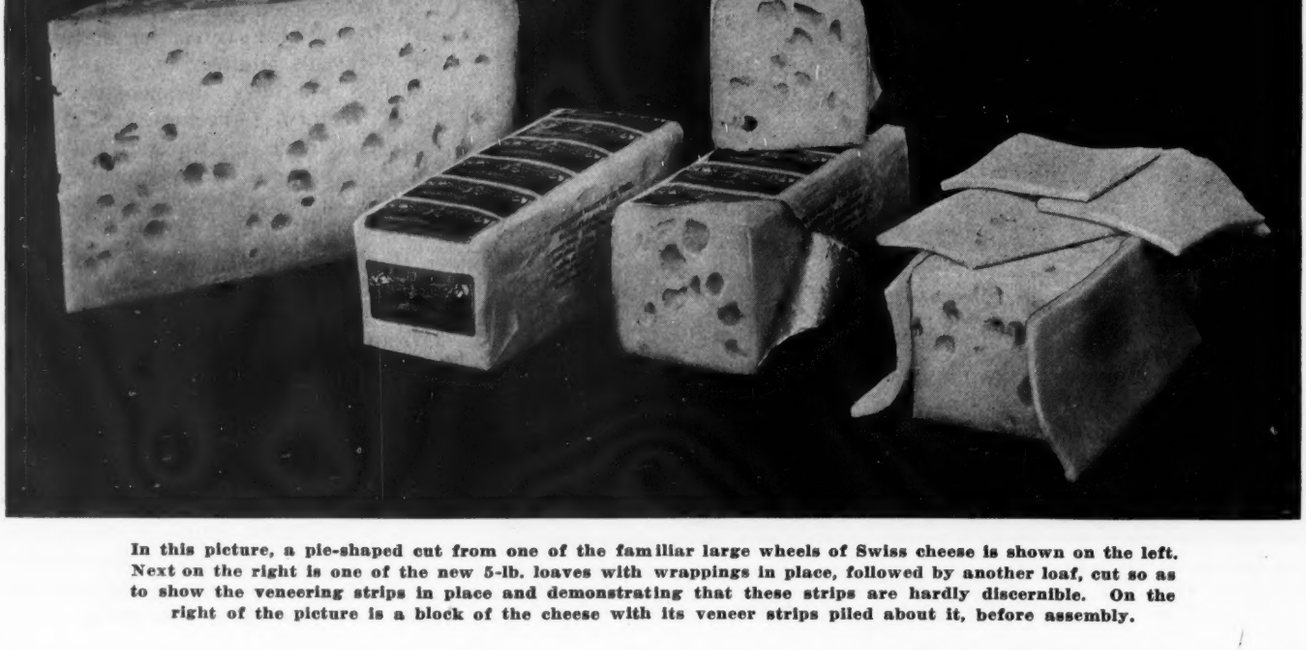
Heretofore, the only way to remedy the difficulty has been to process the cheese into bricks by heating and grinding it. Processing works well with some types of cheese but it injures the flavor and removes the eyes of Swiss cheese, and so reduces quality that the discriminating buyer will not accept it.

The method developed by Challenge offers a new solution of the difficulty. The standard 200-lb. wheel is cut into loaves with the usual wire cutting machine. About 50 lb. of small pieces remain. They are heated and pasteurized, and then molded into blocks of cheese free from holes. They are then cut into sheets $\frac{1}{8}$ in. thick and are used to veneer the "eyed" bricks. The face of the eyed brick is softened by holding a hot iron near but not against it for a few seconds and then the veneer is pressed upon it and adheres perfectly. All six surfaces of the loaf are covered in this manner, giving a finished loaf that is completely sealed with an impervious layer of pasteurized cheese. It is finally wrapped in tinfoil and parchment paper.

The joint between the veneer and the cheese is so perfect that it usually is invisible when the loaf is sliced. The only evidence that remains is that some of the holes near the edge are D-shaped. There is no waste in cutting for use and molding does not occur.

The wholesale cost is now only half of that for imported Swiss cheese. In addition the absence of waste in cutting should make possible a smaller retail mark-up. The result should be a wider market and larger consumption.

The inventors are C. L. Mitchel and E. L. Wetmore. They are applying for a patent on the new product.



In this picture, a pie-shaped cut from one of the familiar large wheels of Swiss cheese is shown on the left. Next on the right is one of the new 5-lb. loaves with wrappings in place, followed by another loaf, cut so as to show the veneering strips in place and demonstrating that these strips are hardly discernible. On the right of the picture is a block of the cheese with its veneer strips piled about it, before assembly.

Out In The Open at Last

The Selenium Problem

★ Whispered confidences, and "don't quote me" gossip heretofore have been the means of transmitting the surprising tale of selenium from person to person. During the past year *Food Industries* has heard these rumors from a dozen sources.

★ Now that Dr. Henry G. Knight, of the Bureau of Chemistry and Soils has made public the known facts, they are less spectacular though very interesting and important.

★ Selenium is a rare element, resembling sulphur in many respects, but it is poisonous to most animal life.

SELENIUM poisoning is the cause of serious difficulty with cattle and other animals, accounting for both "alkali disease" and the acute attacks of "blind staggers." Research by the Bureau of Chemistry and Soils now demonstrates that widespread presence of selenium in the soil of much of the Western wheat territory causes these two troubles of stock growers, and solves what were hitherto rather mysterious problems.

The bulk of the difficulty thus far discovered is in South Dakota and Wyoming. However, all Western brown to black soils, in semi-arid territory where wheat is the principal crop, are somewhat affected. A wide variety of grazing and crops is involved, but the effect on cattle is most serious. Examination of wheat from Canada, Australia, Argentine, and other sources indicates that the problem extends about equally to those countries also.

Seemingly, all the territory where wheat is extensively grown throughout the world is semi-arid. Many of the soils in these regions have been formed by the decomposition of rock containing pyrite and related sulphide minerals. Almost universally, such minerals contain selenium as well as sulphur, producing greater or less concentration of this toxic element in the soil according to the proportion in the original rock. International cooperation in the solution of the problem may, therefore, ultimately become necessary.

Thus far the investigations in the United States of the suspected territory indicate that at least 50,000 acres of agricultural land should be completely withdrawn from production in order to prevent the recurrence of selenium poisoning. Many millions of acres require survey to determine where in the wheat belt of the West other dangerous concentrations may be found. The government is proceeding on the needed survey at the present time in cooperation with state and agricultural interests.

Food growers and processors need have no fear that serious consequences to human food are going to result, despite the fact selenium poisoning to humans would occur if dangerously high concentrations of this element were present in many constituents of the diet. The problem is apparently universal, so far as wheat is concerned, but blending of wheat from a variety of sources is almost certain to reduce commercial milled products well below any requirement necessary for public health reasons.

Feed problems are vastly more serious. Some types of vetch, freely eaten by livestock, are virtually selenium concentrators. Strangely enough, other varieties, and fortunately, the preferred grasses, do not have this selective absorption characteristic. However, practically all crops do absorb some selenium from seleniferous soils. Hence elimination of soil of high concentration altogether from either grazing or crop raising seems the only remedy.

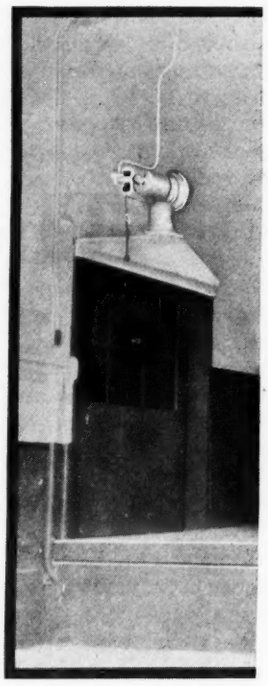
It is likely that as the work progresses some definite limits for the selenium content of both foods and feeds will be prescribed. It appears that 3 to 5 parts per million of selenium in either food or feed is not dangerous. It appears that concentrations from 15 parts per million up are definitely associated with chronic selenium poisoning. Exclusive diet of such high concentration would lead to the acute form of the disease referred to as blind staggers in stock. There are no well-authenticated cases of selenium poisoning to humans from contaminated foods. Presumably, with a widely varied diet there is little opportunity of such food poisoning, even though some highly contaminated food might occasionally go into trade and become part of a mixed diet.

Systematic Plant Maintenance

Lowers Operating Costs

No man is infallible. Plant executives may intend to have careful inspection and to keep plant and equipment in best of repair. But without a schedule or a well-worked-out program, demands of the moment may cause costly delays or omissions. One ice cream company has taken the guesswork out of its plant operations and maintenance by the adoption of a plant manual.

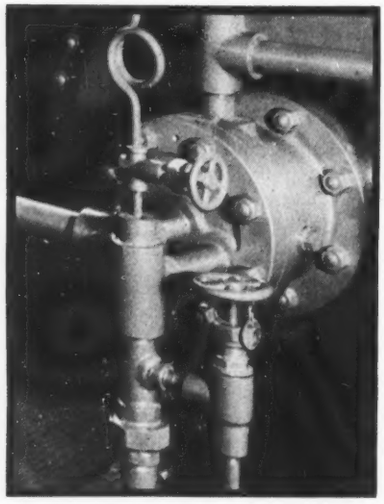
By VICTOR BUHR
Equity Construction Company, New York, N. Y.



Structural jambs around door openings, angle guards on corners of brick wall, and angle guards on edge of receiving platform and curb are details of construction which help keep maintenance low.

PROPER plant maintenance can hardly be discussed without a few words on plant construction, particularly those details of permanent construction which can be incorporated easily in the plans at their inception and which, throughout the life of the plant, will aid in avoiding repairs and replacements.

Two things that should be stressed in the plant design and construction are the needs for sanitation and low cost maintenance. While these are separate subjects, the proper planning of the job will coordinate the requirements. Attention to even the smallest details at the outset will aid in preserving thorough cleanliness and low maintenance costs. For example, such items as properly rounded corners at walls and at intersections of floors and walls, and plain, substantial structural casings at all door openings, will prevent the collection of dirt and also will avoid repairs such as patching of broken corners and replacement of door trim. Drains of adequate size, properly located, will prove a blessing in many ways. Often one sees puddles of water on a production floor. They are hazardous, unsightly, and cause deterioration of equipment and finish. Proper drainage would avoid this trouble.



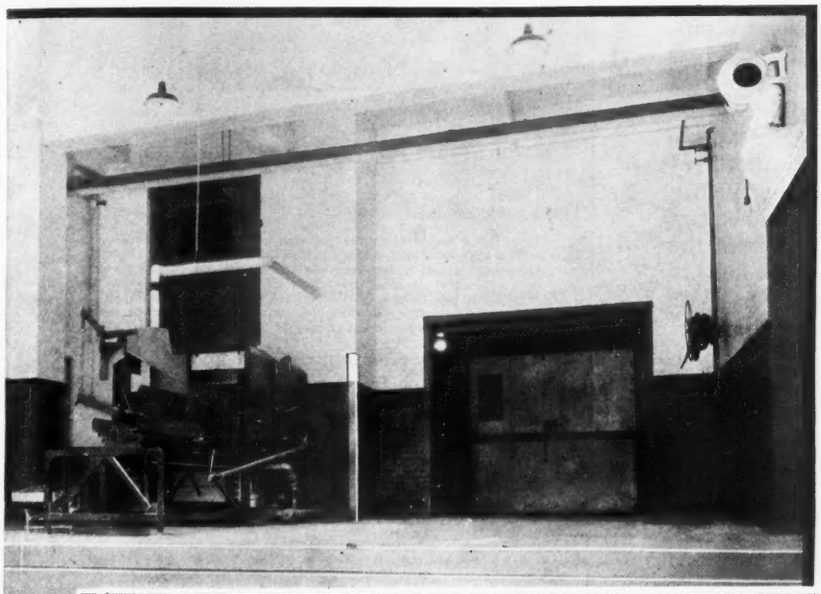
Valves throughout a plant may be identified and designated by small metal tags for listing in a Maintenance Manual.

In manufacturing areas the type of finish selected for floors and walls is all important. Where considerable washing down is done, vitreous materials such as enameled brick or glazed tile are desirable for wall surfaces. The original expense is greater, but the cost of repainting is avoided so that there is a saving in the long run.

There are many good paints, but their successful use depends upon proper application. When the painting of any particular space is contemplated, it should be reserved for a time when operation can be conveniently suspended. Excessive moisture within the room, causing damp walls before or during the painting, will give an unsatisfactory job.

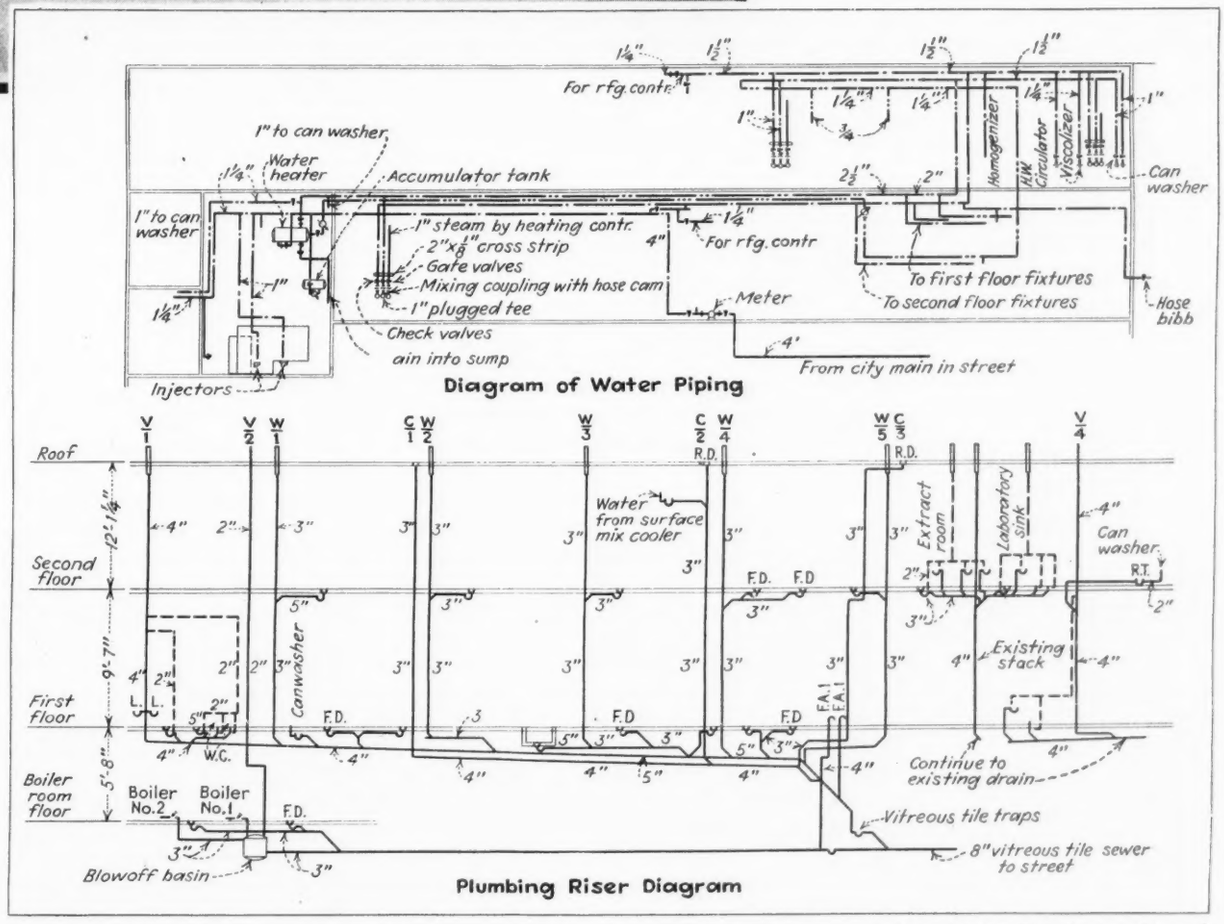
An ice cream plant is not an ordinary building. Hard usage of the various spaces, extreme fluctuations in temperature between adjoining spaces, and necessity for watertight floors make it a complex building operation. Thorough knowledge of the manufacturing processes and their demands are necessary to its proper design and construction. The arrangement of the spaces and mechanical services of refrigeration, steam, water, and electricity will, in a large measure, determine efficiency of operation. The finest, most expensive equipment, unless properly served by the energies required will not function at its best.

With an appreciation of the foregoing and with the knowledge that the building and equipment of an ice



economy, the importance and necessity of the maintenance work is often overlooked; it is regarded as of secondary consideration.

Looking after repairs and maintenance should be part of the plant operator's regular duties, and this item of his work should be one that is never considered as complete. If this work is delayed or put off until physical indications of an actual breakdown make it necessary, the cost of repairs and replacements will be considerably higher than under a regular scheduled system of maintenance. Also the inconvenience and



By plan drawings details of construction and arrangement can be made a part of a permanent record in a Maintenance Manual.

cream plant involve a heavy capital investment, why is it then that such an extensive indifference exists to the proper care of building and equipment? Lack of this care is a sure way to invite trouble and expense. Proper periodic plant maintenance is a form of life insurance on the investment in the plant.

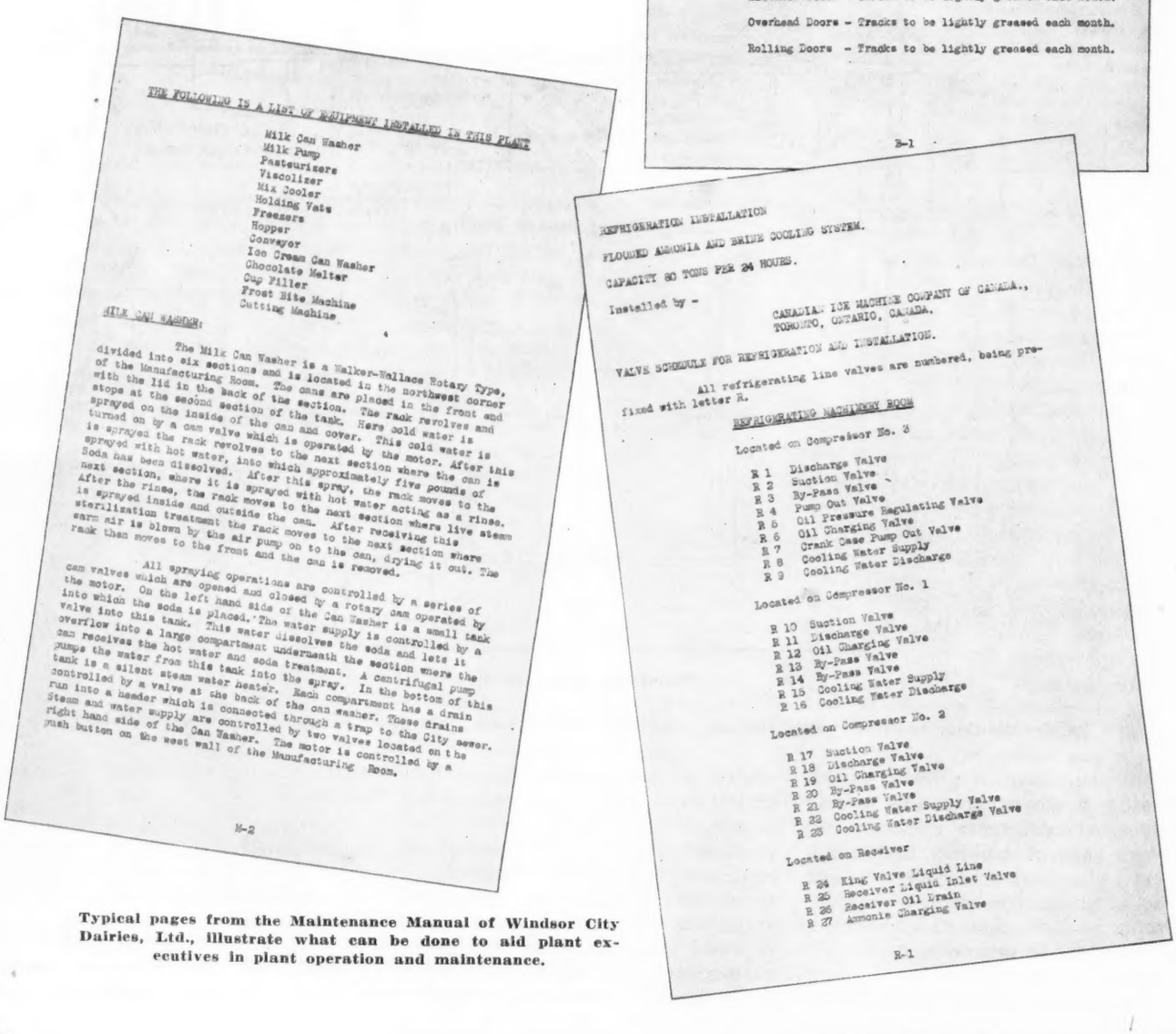
Carelessness often accounts for neglect of maintenance, which may be left to be done at spare times and is put off until tomorrow, or a job is started and left in semi-completed condition awaiting future opportunity to utilize the spare time of regular employees for completion. No fault is found with the policy of employing regular plant help for such work, but when this is done as a means of interruption of production will be excessive.

A means of insuring against losses caused by neglect is to prepare a MAINTENANCE MANUAL; an operating and maintenance schedule. In this, every factor of possible economy in up-keep and operating costs is worked out in complete detail. Through properly classifying and

enumerating various portions of the building and equipment, it can be referred to at specific times and the actual servicing of the equipment and appurtenances can thus be definitely controlled. This detailed schedule can be further augmented with catalogs and manufacturers' instructions giving the proper method of lubrication, rebuilding or repair of the various units. Keeping such a manual up to date is also an accurate means of keeping an inventory of the plant equipment and provides the data from which an intelligent appraisal can be quickly made. Such a manual in the hands of the plant engineer and the plant manager is a great help in eliminating carelessness and in fostering economy.

Operating heads of a business generally understand the importance of proper maintenance and upkeep. However, they do not have the necessary time or may not be fully familiar with the component details that make up a modern plant. Because of this situation the importance of having a good plant man is too often overlooked. Main consideration is given to hiring a man at the lowest possible salary. Such economy proves expensive in the end. A good man saves the difference between his salary and that of a less capable man

(Turn to page 52)



BUILDING MAINTENANCE

PAINTING

All exterior metal work, especially structural steel, is to be painted every two years. The interior walls to be painted at regular intervals.

FLOOR WATER-PROOFING

The second floor, in the Manufacturing Room, General Space, and Milk and Fruit Storage Rooms, has been water-proofed with membrane water-proofing over concrete floor slab. In placing hangers for future lines or equipment, absolute care must be exercised so that holes do not exceed 3" deep in the ceiling of the first floor. In drilling the second floor in the above mentioned rooms for the placing of anchor bolts, holes must not exceed 2" in depth.

ROOF

The roof planking is 2" in thickness and any screws or lag screws placed in this roof planking for hangers should not exceed 1-3/4". Do not at any time drive nails in this roof planking. Should any nails or screws be driven entirely through the planking they would pierce the five-ply felt roofing material and cause the roof to leak.

The entire roof is covered by a twenty year bonded Barrett Roofing. This bond guarantees the roof against any serious depreciation of material or workmanship given to natural causes of wear and tear, but does not provide against punching holes through the roof. If occasion arises where work must be done on the roof, the area where this work is done must be properly protected by boards. Care should be exercised to see that none of these boards have nails in them which might pierce the roof. Clean this roof about once a month to prevent leaders from being stopped up. This roof was installed by the Cunningham Sheet Metal Works, 414 Kildare Rd., Walkerville, Ontario.

DOORS

Tin Clad Doors - All tin clad fire doors must be kept clear at all times and inspected for operation each month.

Elevator Doors - Tracks to be lightly greased each month.

Overhead Doors - Tracks to be lightly greased each month.

Rolling Doors - Tracks to be lightly greased each month.

M-1

THE FOLLOWING IS A LIST OF EQUIPMENT INSTALLED IN THIS PLANT

Milk Can Washer
Milk Pump
Pasteurizers
Viscolizer
Mix Cooler
Holding Vats
Freezers
Hopper
Conveyer
Ice Cream Can Washer
Chocolate Melter
Cup Filler
Frost Bite Machine
Cutting Machine

MILK CAN WASHER:

The Milk Can Washer is a Walker-Wallace Rotary Type, divided into six sections and is located in the northwest corner of the Manufacturing Room. The cans are placed in the front end with the lid in the back of the section. The rack revolves and stops at the second section of the tank. Here cold water is sprayed on the inside of the can and cover. This cold water is turned on by a cam valve which is operated by the motor. After this is sprayed the rack revolves to the next section where the can is sprayed with hot water, into which approximately five pounds of Soda has been dissolved. After this spray, the rack moves to the next section, where it is sprayed with hot water acting as a rinse. After the rinse, the rack moves to the next section where live steam is sprayed inside and outside the cans. After receiving this sterilization treatment the rack moves to the next section where warm air is blown by the air pump on to the can, drying it out. The rack then moves to the front and the can is removed.

All spraying operations are controlled by a series of cam valves which are opened and closed by a rotary cam operated by the motor. On the left hand side of the Can Washer is a small tank into which the soda is placed. The water supply is controlled by a valve into this tank. This water dissolves the soda and lets it overflow into a large compartment underneath the section where the can receives the hot water and soda treatment. A centrifugal pump pumps the water from this tank into the spray. In the bottom of this tank is a silent steam water heater. Each compartment has a drain controlled by a valve at the back of the can washer. These drains run into a header which is connected through a trap to the City sewer. Steam and water supply are controlled by two valves located on the right hand side of the Can Washer. The motor is controlled by a push button on the west wall of the Manufacturing Room.

M-2

REFRIGERATION INSTALLATION

FLOODED AMMONIA AND BRINE COOLING SYSTEM.

CAPACITY 80 TONS PER 24 HOURS.

Installed by -

CANADIAN ICE MACHINE COMPANY OF CANADA.,
TORONTO, ONTARIO, CANADA.

VALVE SCHEDULE FOR REFRIGERATION AND INSTALLATION.

All refrigerating line valves are numbered, being prefixed with letter R.

REFRIGERATING MACHINERY ROOM

Located on Compressor No. 3

R 1 Discharge Valve
R 2 Suction Valve
R 3 By-Pass Valve
R 4 Pump Out Valve
R 5 Oil Pressure Regulating Valve
R 6 Oil Charging Valve
R 7 Crank Case Pump Out Valve
R 8 Cooling Water Supply
R 9 Cooling Water Discharge

Located on Compressor No. 1

R 10 Suction Valve
R 11 Discharge Valve
R 12 Oil Charging Valve
R 13 By-Pass Valve
R 14 By-Pass Valve
R 15 Cooling Water Supply
R 16 Cooling Water Discharge

Located on Compressor No. 2

R 17 Suction Valve
R 18 Discharge Valve
R 19 Oil Charging Valve
R 20 By-Pass Valve
R 21 By-Pass Valve
R 22 Cooling Water Supply Valve
R 23 Cooling Water Discharge Valve

Located on Receiver

R 24 King Valve Liquid Line
R 25 Receiver Liquid Inlet Valve
R 26 Receiver Oil Drain
R 27 Ammonia Charging Valve

R-1

Typical pages from the Maintenance Manual of Windsor City Dairies, Ltd., illustrate what can be done to aid plant executives in plant operation and maintenance.

What the Meat Packer Looks for in

SALT

Meat packers are the largest consumers of fine and rock salt in the food industries. Their demand for fine salt for curing meats amounted to 319,000,000 lb. annually in pre-depression years.

By C. ROBERT MOULTON
Evanston, Ill.

Cured hams awaiting the smoke.

IN THE meat-packing industry, salt is a chemical agent used to inhibit or retard growth of bacteria. The packers use salt in many grades, ranging from the fine pure product to coarse rock salt.

For the curing solution, a clean salt, of course, is advisable. But the size of crystal, the rapidity with which it goes into solution and even the amount of impurities normally present in commercial curing salts are of no importance. Experience has shown that the rate of salt penetration, the general development of the cure and even the flavor are not affected by impurities when the quantity is not much in excess of that in the average commercial salts.

The majority of meat packers find it economical to make pickle solutions from bulk rock salt, and they find that this type of solution is readily clarified or filtered. Some salt manufacturers, however, advise the purchase of salt that is kept free of insoluble matter by a protective container.

For barreled pork, the packer may use either rock salt or a fine capping salt. In either case, a very good grade is required. For oleomargarine, settling of oleo stock in rendering, in the curing of casings and in dry curing, a high-quality fine salt is required. But even here, impurities cause no particular trouble. A good, clean, fine-grained salt free of alkali is all that is required.

Rock salt is used by most packers for curing hides. Not only is it less expensive than fine salt, but it is much more easily handled and recovered in the hide cellar—an excess of salt always is used in the hide pack. In salting hides, the workmen spread the salt with a shovel over the flesh side of the hide. Rock salt takes up water from the hide and forms a brine, the brine in turn being absorbed by the hide. Incidentally, it is important that the salt get into the hides as quickly as possible after flaying, and rapid handling is the proper procedure. When the hides are taken out of the pack, the excess salt is shaken or brushed off, and this is where rock salt has a decided advantage—it comes off easily while fine salt sticks badly.

An alkaline salt or brine is somewhat of an aid to the bacteria which damage hides, while an acid salt helps to hold them in check. Most salts, however, are sufficiently acid and only a few of the commercial grades need watching in this respect.

As for impurities in salt for hide curing, it can be stated that they are of little or no importance except as they may be related to alkalinity. The small amounts of chlorides and sulphates of calcium and magnesium that may be present are of no consequence. While the rate of absorption of salt is important, the usual impurities are without effect. Iron is an impurity sometimes blamed for the so-called "iron stains" on hides. If iron in rock salt is a factor, it is the least important one. Much more serious is the presence of blood and manure on the hides and the forming of regions where salt is not rapidly absorbed. The iron that salt may contain is nothing compared to that in the blood on dirty hides. A washed or cleaned hide nearly always is free of iron stains.

In the minds of some packers there is a question as to the presence of bacteria in salts. A recent report shows that apparently no concern need be felt on this score. Salt does not provide a good environment for bacterial growth. However, bacteria do remain alive on it, as has been shown by a study of "second salt" removed from hide packs. When the margin of safety in meat going into cure is too narrow, salt containing bacteria might possibly throw the balance in favor of factors leading to spoilage. In products such as canned spiced ham or other cured, minced pork items, which are processed in cans at temperatures considerably below the sterilization point, the packer's defense lies in keeping the number of bacteria at an unusually low level and then relying on curing, cooking and storage under refrigeration to maintain quality and flavor. In such cases, the bacterial content of the salt used should be investigated. With other cured products, bacterial content seems unimportant.

Packers using fine salt should see to it that the product is protected by the proper type of container. It is highly absorptive and must be kept dry. Paper-lined barrels offer protection to this product. Aside from the container, the packer must pay attention to conditions under which he stores this fine salt.

While rock salt is bought in bulk by the carload or truckload, it must be kept clean and dry enough so that it will not cake or form a brine.

Maybe Diesels Are Your Answer

By E. J. TANGERMAN
Associate Editor, Power

"THAT wonderful new prime mover, the diesel." You've read and heard about it. No doubt you've wondered whether diesels would cut your power costs. They might. Since power costs bulk large in any food-processing plant (6.4 hp. installed per wage earner), let's look into the matter.

Considered as an individual unit, the diesel is the most efficient of all prime movers, turning 30 to 35 per cent of the fuel's heat into electricity or mechanical power. But that isn't the whole story—you may need more process heat than you do power, or more hot water, or your power rates may be exceptionally low, or your power plant may be so large that it is really a small central station. After all, the diesel isn't a cure-all any more than are steam engines, turbines or purchased power. Among the factors you'll have to consider are: price of purchased electricity, purchased power demand charges, delivered price for coal, boiler oil and diesel oil, amount and time of process steam demands, first cost of equipment, size and steadiness of power load in the plant.

What are its disadvantages? The diesel costs much more than a gasoline engine because of the higher pressures and temperatures, and usually requires more skilled operators. Reliability? Just as good as that of any other prime mover. Space required? Less than for a steam plant, more than for the switch and meter boards of purchased power. Overloads? Normally, the diesel cannot take more than 5 or 10 per cent overloads, and then for short periods only. Thus a diesel plant must have capacity to handle maximum load requirements plus reserve capacity if continuous service is essential. Diesels start easily and take load immediately; there is no "warming up" period. Hence the plant is extremely flexible and can handle wide variations in load without hesitation. On part loads, fuel consumption increases only slightly until load drops below half. Fuel consumption drops to nothing when the engine is shut down; there is no necessity for standby firing as with a boiler plant or a demand charge as with purchased current, although there is of course depreciation and interest on investment.

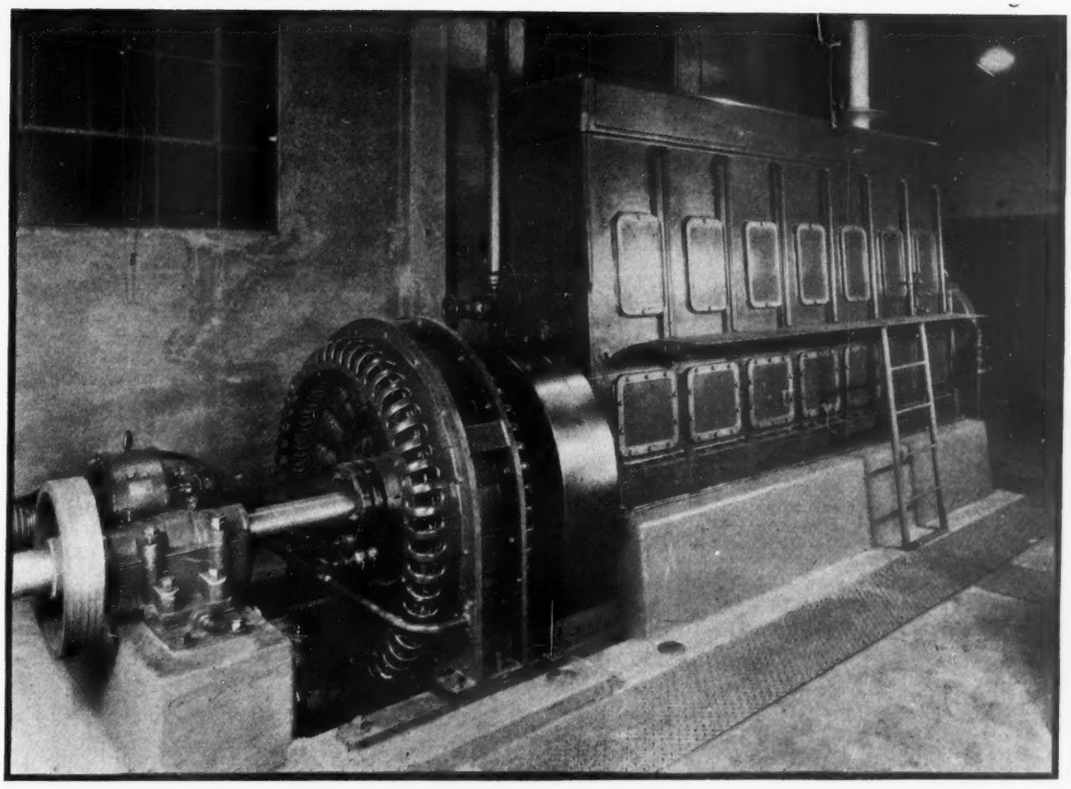
Now for the matter of first cost. Diesels smaller than 500 hp. usually cost much less per horsepower installed than do steam plants, and between 500 and 2,000 hp. about the same. Cost usually runs from $60 to $100 a horsepower, with the average around $75. Cheap engines may run as low as $30 or $40. This would mean $100 a kilowatt, plus $25 or $30 a kilowatt for generator, exciter, foundation and installation.

Operating costs are very low. Best diesels burn about 0.36 lb. of fuel oil per horsepower per hour, with the usual engine around 0.40. Or on a kilowatt-hour basis, fuel will cost 3.5 mills, lubricating oil 0.35 mill, and repairs and supplies about 0.5 mill, giving a total of 4.35 mills per kilowatt-hour with 4-cent (per gal.) fuel oil. With 5-cent fuel oil, the figure rises to 5.1 mills (A.S.M.E. 1932 figures at 3,000 kw.-hr. per kw. installed). This of course does not include labor, depreciation, interest on investment, insurance, building rent or other similar charges, nor does it credit the engine with the possible saving from recovery of waste heat. All these items vary so much with the particular plant that only very general figures may be given, some plants for example charging nothing for labor against the engine because no more labor is required after the engine is installed than before. For reliable cost data on various sizes of plants get a copy of the latest report of the Oil & Gas Power Division, American Society of Mechanical Engineers, 29 West 39th St., New York, N. Y.

Fuel consumption varies but little as size changes. With equally good design, there is less than 10 per cent difference between engines of 100 and 1,000 hp., less than 20 per cent between engines of 50 and 5,000 hp. There are much greater differences between various makes of engines. Because of this and the almost equal cost per horsepower of large and small engines, many of the newer plants are installing several small engines instead of one or two large ones, thus allowing those in use to be operated at good load factor and highest efficiency and insuring against service interruption.

I said before that the diesel was not a cure-all, nor was any other prime mover. In amplification of that statement, I should explain that combinations of prime movers may prove best, such as that of Pau Corp., at the Union Stockyards, where steam turbines, diesel and purchased power carry the load between them. In this particular station, as in many other food plant power plants, there is the question of process heat to be considered, a question so important that it is to be the topic of a later article, in which the Pau setup is analyzed. Other cases for the composite plant might consider such elements as: cheap but unreliable power service (single feeder, or feeder from only one substation), isolated plant with a single boiler, turbine or engine, plants with very high load peaks (introducing heavy standby costs or excessive "demand" charges), light holiday, night and Sunday loads. There is also the possibility that one power plant may serve several users. That of Pau Corp. does.

The 10,000 merchant flour mills of this country before the World War have shrunk to 4,000 or less, but mills have increased from an average of 150 or 100-bbl. units to 600-bbl. plants taking about 200 hp. in



Saving in floor space is an obvious advantage of this diesel, installed in the soybean mill of Ralston Purina Co., Lafayette, Ind.

power. Milling, a 24-hr. process for 250 days a year, provides a heavy constant load plus high intermittent loads when grain is being received during the season, but the other third of a year the plant is almost closed. This means high demand charges with purchased power in most instances. Add to that the fact that most mills have old drives wasting as much as half the power delivered to them, and you have power costing from 10 to 30 cents a barrel of flour milled. Modernizing the drives is the first step (one wasted horsepower in drives costs over $100 a year with 1¼-cent power), the second is to check power supply for maximum economy. Diesels in this service have excellent speed regulation and no fire hazard, both important, and have in many cases cut power costs to 4 or 5 cents a barrel.

Normal practice has been to use diesel-electric sets with standby in plants larger than 2,000 bbl. per day, several small diesel-electric sets without standby in mills of 1,000 to 1,500 bbl., and direct drives in smaller plants. Usually 40 hp. of rated engine capacity is allowed per 100 bbl. of capacity on mills above 1,000 bbl., 50 hp. per 100 bbl. on plants of 250 to 1,000 bbl. per day, and 60 to 80 hp. in smaller plants.

One outstanding large flour mill dieselized power plant is that of Commander Milling Co., Minneapolis, Minn. This company mills a barrel of flour with 6¼ kw.-hr. of electricity costing 6.41 mills apiece—roughly 4 cents a barrel! The old plant consisted of steam engines and turbines with a 360-hp. diesel for auxiliaries, lighting, etc. Bought in September, 1925, the diesel generated 8,392,000 kw.-hr. in 76 months under load varying from 160 to 240 kw., thus averaging 4,200 kw.-hr. per 24-hr. day. Out of a possible 2,280 days, the engine ran 1,998, on several occasions six to seven weeks without shutdown, all with lubricating oil and fuel costing 5.5 mills per kw.-hr. When the company considered a modernization in 1932, they found that this figure could be made 5 mills, and that labor, insurance, taxes, supplies and maintenance would add another 2 mills per kw.-hr. Best purchased power rates were 11 mills (including taxes, insurance, etc., on equipment). On this basis, a complete diesel plant would save $31,600 a year—3 cents on every barrel of flour milled!

So Commander installed three 800-hp., 16 x 20-in., 2-cycle diesels driving 551-kw. alternators, making total power capacity 2,760 hp. The next six months (February through July) the new plant generated 2,512,030 kw.-hr. plus 70,050 kw.-hr. for station auxiliaries (2.8 per cent). Fuel and lubricating oil cost $9,772.94, labor $3,298.50, taxes and insurance $1,716, maintenance reserve $1,200, supplies $161.06, a total of $16,098.50, as contrasted with the comparative purchased power cost of $28,851.67, a saving of $12,753.17 on 90,000 bbl. milled which could be applied to paying off the installation. Production averages 11.2 kw.-hr. of power per gallon of fuel oil.

Refrigeration is another great need of food plants, particularly in dairies, breweries, food stores and markets, ice and cold storage plants and ice cream plants. A good plant can produce ice at $1 a ton with purchased power, power costing $0.55 a ton, labor $0.30, water, ammonia, salt, oil, waste and maintenance costing the rest. Diesels will ordinarily reduce the power cost about 20 cents a ton —a 20 per cent reduction which may become 25 per cent in plants where the cost of other elements is less.

Listed in the accompanying table are only those food plant diesel installations made since Jan. 1, 1932. But many diesel plants have been in operation much longer than that.

Worthy of mention in connection with diesel-driven refrigeration plants

is the comparatively new "unibloc" engine-compressor, a diesel with one or more of its cylinders converted to ammonia compressor cylinders. This avoids couplings, reduces space, and gives smoother operation.

Above all, remember that the diesel is not a cure-all and must be considered fairly with other sources of power. If you need some process heat, the next article will explain how much can be gotten from a diesel. If you need more, a steam plant will be required. This question of process heat is extremely important in many food plants. In any case, if a diesel plant appears at all promising, find a good, dependable, *unbiased* consulting engineer. He'll tell you what the chances are for diesels, and if they're good, he'll lead you through the mazes of 2-stroke cycle versus 4-stroke cycle, solid versus air injection, and other mechanical intricacies.

Recent Diesel Installations in Food Plants

(Made During Past Two Years)

Owner	Location	Service	Unit Driven	No. Engines	Hp. per Engine	R.p.m.	No. cyl.	Cyl. Bore, in.	Stroke, in.	Cycle	Acting	Fuel Injection	Fuel Consumption, lb. per b. hp.-hr.	Kw.-hr. per gal., full load
Pau Corp. (Stock Yard)	Chicago, Ill.	Packing C. S. Supp.	F. Gen.	1	3,000	240	10	19½	27	2	S	S	0.41	.....
Commander Mllg. Co.	Minneapolis, Minn.	Flour Mill	Gen.	3	800	277	5	16	20	2	S	S	0.41	11.7
New Era Milling Co.	Arkansas City, Kan.	Plt. Pr.	Gen. & Shaft	1	750	275	6	16	24	4	S	S	0.40	.....
Progress Brewing Co.	Okla. City, Okla.	Plt. Pr.	Gen.	1	700	...	..	16	20	..	..	..	....	12.87
				1	280	300	4	14	17	2	S	S	....	12.13
Kansas Milling Co.	Wichita, Kan.	Mill	Gen.	1	600	225	6	16	24	4	S	A	0.40	.....
New Ulm Roller Mills	New Ulm, Minn.	Plt. Pr.	Gen.	1	450	327	6	13¼	17½	4	S	S	0.39	.....
Manor Road Brewery	Staten Isl., N. Y.	Pr. & Refrig.	Gen.	2	440	420	8	11	14	4	S	S	0.39	.....
Wolf Milling Co.	Ellinwood, Kan.	Plt. Pr.		1	420	300	6	14	17	2	S	S	0.40	.....
Caroill Grain Co.	Minneapolis, Minn.	Flour Mill	Gen.	1	420	300	6	14	17	2	S	S	....	12
				1	210	300	3	14	17	2	S	S	....	12
Brown Linseed Co.	Elm Park, L. I.	Plt. Pr.	Gen.	1	375	327	5	13½	17½	4	S	S	....	.....
				1	300	327	4	13¼	17½	4	S	S	....	.....
Tennant & Hoyt Co.	Lake City, Minn.	Flour Mill	Altr.	2	350	300	5	14	17	2	S	S	0.41	11.2
India Wharf Brewing Co.	Brooklyn, N. Y.	Plt. Pr.	Altr.	2	300	400	6	10¾	15¾	4	S	S	....	.....
Frank Tea & Spice Co.	Cincinnati, Ohio	Plt. Pr.	Gen.	1	300	327	4	13¼	17½	4	S	S	0.39	.....
Sunbury Milk Products Co.	Sunbury, Pa.	Plt. Pr.	Gen.	1	280	400	4	12½	15	4	S	S	0.40	.....
				1	210		3							
Laurinburg Milling Co.	Laurinburg, N. C.	Plt. Pr.	Shaft & Gen.	1	262½	400	7	9½	14	4	S	S	....	.....
Ralston Purina Co.	Lafayette, Ind.	Soy Bean Mill	Gen.	1	262½	400	7	9½	14	4	S	S	....	.....
American Caramel Co.	Lancaster, Pa.	Plt. Pr.	Gen.	1	240	257	4	14	17	2	S	S	....	11.13
				1	110	360	2	12	15	2	S	S	....	11.13
Richards Milling Co.	Cortland, Ohio	Mill	Shaft & Altr.	1	240	300	3	13½	18	4	S	S	0.40	.....
General Mills Corp.	El Reno, Okla.	Flour Mill	Gen.	1	225	360	3	12½	18	4	S	S	0.39	.....
Connecticut Valley Brewing Co.	Meriden, Conn.	Plt. Pr.	Gen.	1	210	300	3	14	17	2	S	S	0.40	12
Randolph Milling Co.	Ava, Ill.	Flour Mill		1	210	300	3	14	17	2	S	S	0.40	.....
H. M. Noack & Son	Arlington, Minn.	Mill, Pr.	Gen.	1	187½	400	5	9½	14	4	S	S	....	.....
Manatee County Growers	Bradentown, Fla.	Refrig.	Comp.	1	165	360	3	12	15	2	S	S	0.42	.....
Rockingham Mllg. Co.	Harrisonburg, Va.	Mill	Gen.	1	162	360	3	12	15	2	S	S	0.42	10
Ball Milling Co.	Lanesville, Ohio	Plt. Pr.	Gen.	1	150	400	4	9½	14	4	S	S	....	.....
Pocatello Cold Storage Co.	Pocatello, Ida.	Plt. Pr.	Gen.	1	150	400	4	9½	14	4	S	S	....	.....
Siler City Mills	Siler City, N. C.	Plt. Pr.	Shaft	1	150	400	4	9½	14	4	S	S	....	.....
Sanford Milling Co.	Sanford, N. C.	Plt. Pr.	Shaft	1	150	400	4	9½	14	4	S	S	....	.....
J. J. Hemphill Farms Corp.	Kennett, Mo.	Plt. Pr.	Shaft	1	150	400	4	9½	14	4	S	S	....	.....
Travers City Milling Co.	Travers City, Mich.	Plt. Pr.	Shaft	1	140	300	2	14	17	2	S	S	0.40	.....
Lyndonville Ice & Cold Storage Co.	Lyndonville, N. Y.	Plt. Pr.	Shaft	1	140	300	2	14	17	2	S	S	0.40	.....
Dewey Bros.	Leesburg, Ohio	Flour Mill	Shaft	1	135	300	2	13¼	17	4	S	S	0.40	.....
Lorenz Freimann	Sandusky, Ohio	Brewery	Comp. & Gen.	1	125	260	2	14½	17	2	S	S	....	.....
H. N. Noack & Sons	Arlington, Minn.	Cold Storage	Refrig. & Alt.	1	112½	400	3	9½	14	4	S	S	0.40	.....
				1	75	400	2							
Rutherford Milling Co.	Rutherford, Tenn.	Mill	Mill	1	112½	400	3	9½	14	4	S	S	0.40	.....
J. J. Massey	Manila, Ark.	Plt. Pr.	Shaft	1	112½	400	3	9½	14	4	S	S	....	.....
New England Wrhs. Co.	Boston, Mass.	Plt. Pr.	Gen. & Shaft	1	112½	400	3	9½	14	4	S	S	....	.....
Wilson Cold Storage	Wilson, N. Y.	Plt. Pr.	Am. Comp.	1	110	257	1	17	19	4	S	S	0.40	.....
Covert Baking Co.	Middleport, Ohio	Refrig.	Comp.	1	110	360	2	12	15	2	S	S	0.42	.....
West Branch Creamery Co.	Milton, Pa.	Plt. Pr.	Gen.	2	100	514	5	7⅛	10½	4	S	S	....	.....
					60	514	3	7⅛	10½	4	S	S	....	.....
Green Bros.	Franklinton, La.	Plt. Pr.	Gen.	1	100	514	4	8	10½	4	S	S	0.41	.....
Alvah J. Nelson	Thomaston, Ga.	Plt. Pr.	Shaft	1	100	514	4	8	10½	4	S	S	0.41	.....
Schram Bottling & Cream Co.	Farmington, Mo.	Plt. Pr.	Gen.	1	100	514	4	8	10½	4	S	S	0.41	.....
F. Pepe Macaroni Co., Inc.	Waterbury, Conn.	Plt. Pr.	Gen.	1	100	360	3	9	14	4	S	S	....	11
Paterson Milk & Cream Co.	Paterson, N. J.	Plt. Pr.	Gen.	2	90	850	4	6½	8¾	4	S	S	0.42	.....
Brown & Fassett	Tunkhannock, Pa.	Flour Mill	Shaft.	1	80	...	..	..	..	4	S	S	....	.....
H. H. Lysinger & Son	Bedford, Pa.	Mill	Gen.	1	75	400	2	9½	14	4	S	S	....	.....
Tulia Mllg. Co.	Tulia, Tex.	Flour Mill	Shaft.	1	75	700	4	6½	9¼	4	S	S	....	.....
Colchester Mllg. Co.	Colchester, Ill.	Flour Mill	Shaft.	1	75	700	4	6½	9¼	4	S	S	....	.....
Sessions Co., Inc.	Enterprise, Ala.	Peanut Shell'g	Shaft.	1	75	820	6	5¼	8	4	S	S	....	.....
Jaub Cty. Mill & Elev. Co.	Nephi, Ut.	Flour Mill	Shaft.	1	70	700	4	6⅜	9¼	4	S	S	....	.....
Keedysville Mllg. Co.	Keedysville, Md.	Flour Mill	Shaft.	1	65	700	3	7	9	4	S	S	....	.....
Chestnut Ridge Dairy Co.	Akron, Ohio	Dairy	Gen.	1	60	514	3	7½	10½	4	S	S	....	.....
Trenton Packing Co.	Trenton, N. J.	Packing Plt.	Am. Comp.	1	52	1,000	3	5⅜	8	4	S	S	....	.....
Milford Center Mllg. Co.	Milford Ctr., Ohio	Flour Mill	Shaft.	1	50	300	1	13	17	2	S	S	....	.....
Weida's Inc.	Paterson, N. J.	Candy Plt.	Gen.	1	50	1,200	6	4	5½	4	S	S	....	.....
Liberty Ice & Creamery Co.	Festus, Mo.	Ice Plt. & D'r'y	Gen.	1	50	514	2	8	10½	4	S	S	....	.....
Java Farm	Annapolis, Md.	Plt. Pwr.	Gen.	1	50	1,200	3	4	5½	4	S	S	....	.....
Eagle Rock (Va.) Mllg. & Mfg. Co.		Flour & Ice		1	50	850	4	5¼	8	4	S	S	....	.....
Yelton Milling Co.	Ruthfordten, N. C.	Mill	Shaft.	1	50	514	2	8	10½	4	S	S	....	.....
Chief Dairy Co.	Upper Sandusky, Ohio	Creamery		1	50	850	4	5¼	8	4	S	S	....	.....
J. H. Good	Woodson, Tex.	Dairy	Am. Comp.	1	45	425	1	11½	12½	4	S	S	....	.....
C. Haag	Secaucus, N. J.	Meat Plt.	Comp.	1	38	1,000	4	4½	5½	4	S	S	....	.....
W. H. Hart	Poughkeepsie, N. Y.	Apple Stge.	Comp.	1	38	1,000	4	4½	5½	4	S	S	....	.....
Cross Orchard	Lagrangeville, N. Y.	Apple Stge.	Comp.	1	38	1,000	4	4½	5½	4	S	S	....	.....
Lt. Butt	Center Pt., Ind.	Feed Grdr.	Shaft.	1	35	300	1	11½	16	4	S	S	....	.....
Martinsburg (Pa.) Mllg. Co.		Mill	Shaft.	1	25	...	..	..	..	..	S	S	....	.....
Avondale Farms Dairy	Allentown, Pa.	Sub-plant store	Gen.	1	18	1,000	2	4½	5½	4	S	S	....	.....
				1	9	1,000	1	4½	5½	4	S	S	....	.....
H. H. Brown	Spring Valley, N. Y.	Apple Stge.	Ref.	1	18	1,000	2	4½	5½	4	S	S	....	.....
Mt. Pleasant Ice Cream Co.	Thornbury, N. Y.	Ice Crm. Plt.	Am. Comp.	1	16	1,200	2	4½	4½	4	S	S	....	.....
Annex Dairy	New Haven, Conn.	Dairy	Comp.	1	8	1,200	1	4½	4½	4	S	S	....	.....
Elmer H. Geron	Mattawan, N. J.	Dairy store	Am. Comp.	1	5	600	1	4½	5½	4	S	S	....	.....
Sutton Mills	Sutton, Neb.	Night Light	Gen.	1	5	600	1	4½	5½	4	S	S	....	.....

Abbreviations:
C.S.—Central Station
Supp.—Supplementary
F. Gen.—Flywheel generator
Gen.—Generator
Altr.—Alternator
Comp.—Compressor
Am.—Ammonia
S(under "Acting")—Single
S(under "Fuel")—Solid
A—Air Injection
Priv.—Private
Pr.—Power
Plt.—Plant
Ref.—Refrigeration
Stge.—Storage
b. hp.-hr.—brake horsepower-hour
kw.-hr.—kilowatt-hour

Acceptance of
Soya Flour
Depends on Correct Processing

Improvements in process avoid a bean-flavored product, enhance keeping quality, and provide food manufacturers with an ingredient high in protein, rich in fat, and low in carbohydrates to complement starchy flours and supplement milk in food formulas.

By A. A. HORVATH
Newark, Delaware

Many products containing soya flour are now available for ordinary consumption, in addition to the special diet foods that have long been known.

STEADY gain in popularity of edible flour from whole soybeans in this country is due primarily to the manufacture of a product high in quality and pleasant in taste with an average protein content of 40 per cent and an oil and lecithin content of 20 and 2 per cent respectively.

The first objective of "processing" is to enactivate the enzymes of the soybeans, such as: the lipase, the oxidases and peroxidases. These enzymes are capable of liberating free fatty acids from soybean oil, of oxidizing them into nonylaldehyde and dioxyacetone, and of destroying vitamines A and D. A rapid inactivation of the enzymes by a sufficiently high temperature in the absence of oxygen is the condition to be recommended for the manufacture of edible soya flour. The Goessel process seems to be today's preferred method. Yet, there are manufacturing methods still in existence in which the beans are soaked at room temperature in water for hours, ground to an emulsion and subsequently dried by the spray method. When these methods are used the enzymes as well as oxygen have very favorable conditions for detrimental action.

The "quality test" for edible soya flour should therefore include the determination of enzymatic activity—preferably by the urease method—of free fatty acids, of oxyacids, and of aldehyde and ketone bodies.

The second objective of "processing" the soybeans in the manufacture of edible flour lies in removing the objectionable beany taste. One of such substances has been isolated and its formula established as a methyl-*n*-nonyl-ketone, which seems to be located in the outer layers of the bean cotyledons.

The rationality of a refining process can therefore be ascertained by the quality of the refined whole soybeans, which are sold in Europe as a substitute for peanuts and cashews. Correctly refined "soya kernels" have a sweet, pleasant, nutty taste. Numerous unsuccessful attempts to manufacture a "tasty" soya flour have been made by investigators who started with milling the soybeans and attempted the "processing" afterwards. Such a procedure gives the enzymes a chance to exert their action. Roasting is resorted to quite extensively to cover the shortcomings of a "poor" soya flour.

As can be seen from the chemical nature of the flavoring substance of the soybeans no treatment with chemicals is required for refining. These flavor substances can be removed by physical methods in the course of a few minutes. Prolonged treatment at excessive temperatures or by chemicals is capable of "denaturing" the protein (for instance, by lowering its solubility), of saponifying the oil, and bringing about other undesirable changes.

After proper processing, soya flour can be stored without deterioration. The ketone in association with some other unidentified substances may act as a catalyst in the oxidation of the soya oil, but this alone does not explain why a flour containing 20 per cent of oil can be kept safely for many months, while flours from oleagineous seeds do not as a rule possess such a capacity. The reason for such a peculiarity is that soya flour contains a substantial amount of lecithin, which protects the soya oil against oxidation. The old figures for the lecithin content in soya flour are 1.65 per cent, compared with 3 per cent determined recently, which makes the soya flour equal to eggs in lecithin content. It is established that mixtures of fats and phosphatides acquire an unlimited keeping capacity

without undergoing oxidation, without a rise in the acidity number or other deterioration indicators, and also become non-sensitive to comparatively high temperatures.

If the value of soya lecithin is estimated according to the existing price for egg lecithin, 100 lb. of whole soya flour has a lecithin value equivalent to $20. In solvent extracted soya flour, the soya lecithin may be present only in very small quantities, and as lecithin is known to be a powerful emulsifying agent, its presence in whole soya flour gives the flour strong emulsifying properties. The finer the flour is milled the more pronounced is its emulsifying effect.

Our domestic ice cream industry has commented favorably on the experimental incorporation of 1 per cent of edible soya flour in ice cream to add to its smoothness, taste, and keeping qualities. Recently, finely milled, whole-bean soya flour is finding increasing favor in England for "cold mix" ice cream powders, as indicated in the following formula:

Sugar (finely milled)	70.0 lb.
Skim milk powder	17.5 lb.
Soya flour	7.5 lb.
Gum tragacanth	5.0 lb.
Flavor	to suit

From 1½-1¾ lb. of this mix is added to each gallon of cold milk in the "cold mix." In this instance, soya flour is replacing the expensive powdered dried egg yolk.

Another example where soya flour is exerting a dispersing effect is in mixture with cocoa, malt and sugar, which do not adhere to the glass if used as a "shake" with cold milk. In Holland a special brand of chocolate bar of good quality is manufactured with a 25 per cent soya flour content.

The soybean oil, which constitutes about one-fifth of the whole soya flour, possesses a unique property among all the known fats and oils by inducing organic life to as long as 10 hr. of continuous high muscular activity without any apparent fatigue. During the World War many millions of pounds of refined soya oil were used in this country as salad oil, and in recent years it has found a new commercial outlet in the manufacture of mayonnaise.

While "deodorization" is one of the most important and expensive steps in the process of refining a vegetable oil—cottonseed and soya oil alike—for edible purposes, it was interesting to find that Goessel's edible soya flour yields an oil already possessing a sweet, pleasant taste, a property of considerable commercial importance.

Soya oil belongs to the group of semi-drying oils and is one of the causes of lumping of soya flour during storage. For safe storage edible soya flour should be well protected from light and moisture and kept either in barrels or bags with a moisture-proof lining. For the retail trade tin boxes or paraffined paper-lined bags should be made obligatory. Under such conditions a high grade edible soya flour will keep for years, while a poor flour will deteriorate in a few months or weeks. It is surprising that there still are manufacturers who claim a long keeping quality for their soya flour while claiming simultaneously that the enzymes of their flour are active. But one has to say that poor grade soya flour, which either deteriorates on keeping or tastes "beany," seldom appears on the market nowadays as such. Instead it is blended with ingredients which veil its inferiority.

"Poor" soya flour, coupled with unreasonably high prices, has been the main reason for the lack of success of some soya manufacturers. In addition, some patent holders and manufacturers claimed that the raw soybean contained toxic or repugnant substances—claims wholly untrue—but such claims made their processes look more important.

For commercial success soybean flour should be called "Soya flour," as the soybean differs from ordinary beans more widely than do lentils, and as the processed flour possesses a sweet, pleasant taste, resembling nuts without anything "beany" in it. The name "bean" is misleading to the public, creating the wrong association in their minds.

Other unfavorable factors in the successful marketing of soya products have been the publicity soya flour received as a food for diabetics and the miscalculated attempts to induce the American consumer to eat Chinese soya foods or to invent incredible new foods from the soybean material. The logical way of introducing soya flour to the American public seems to be by incorporating a certain percentage of it into some of the existing standard food products, such as bread, macaroni, and cakes, and by marketing it in a form to be used with milk. Recently some progress has been made in this direction as milk and soya flour supplement each other, and there are reasons to expect them to become complementary foods. To say nothing of the advantages of such a combination from the nutritive standpoint, one is impressed by the role of soybean preparations for the creation and maintenance of a favorable intestinal flora and the strikingly high alkalinity of soybean flour as compared with milk.

Absence of good recipes for the use of soya flour is delaying its adoption as an ingredient in food preparations. Since it contains no gluten and practically no starch, and, because of its richness, is more of a food concentrate than a flour, it should be incorporated into wheat products only as a smaller portion from 10 to 25 per cent to enrich the bread, the cake, and other food preparations. Because soya flour does differ so essentially from wheat and rye flours it has been necessary to develop a special technique for soya bread. The failure of many bread manufacturers to produce a good loaf of soya bread is due primarily to the application of old standard formulas to a new combination of ingredients. Dr. J. A. LeClerc, Senior Chemist, Food Research Division, U. S. Department of Agriculture, Washington, D. C., recently developed the following formula for soya bread which gives very good results:

65	parts	by	weight	soya flour
260	"	"	"	wheat flour
10	"	"	"	sugar
5	"	"	"	salt
15	"	"	"	yeast
15	"	"	"	shortening
210	"	"	"	water (variable)

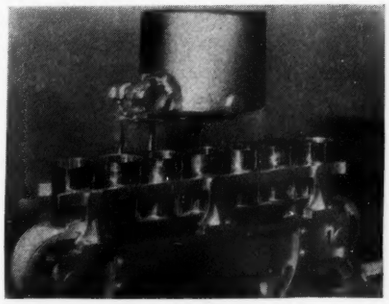
Mix three minutes, ferment at 90 deg. F.

First punch	45 min.
To bench	15 min.
Proof	45 min.
Bake	30 min.
Temperature of oven	445 deg. F.

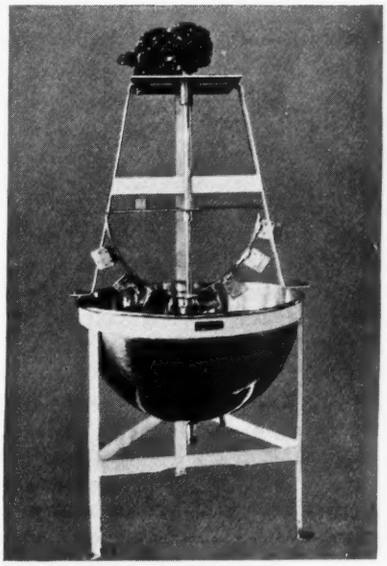
Incorporation of whole soya flour in macaroni, spaghetti, noodles, vermicelli and pancake mixes provides other market outlets and gives highly nutritious and palatable products. A 20 per cent soya macaroni (80 per cent wheat flour) contains 19 per cent of protein with 24 grams of soya protein in every pound.

When one considers that edible soya flour is not expensive, is palatable and nutritious (one pound being equivalent in protein and fat to two pounds of lean beef), and is being widely produced in this country—nearly 19,000,000 bu. of soybean seed in 1931—one can expect to see it become a better known food ingredient and perhaps see it incorporated into the relief ration to supplement the millions of bushels of wheat and corn that are needed to make a healthy and well-balanced diet for the American people.

New Equipment
to Be Seen at
Canners' Exposition



Bulk salt dispenser distributed by A. K. Robins & Co.



Cross-current agitator of Lee Metal Products Co., Inc.

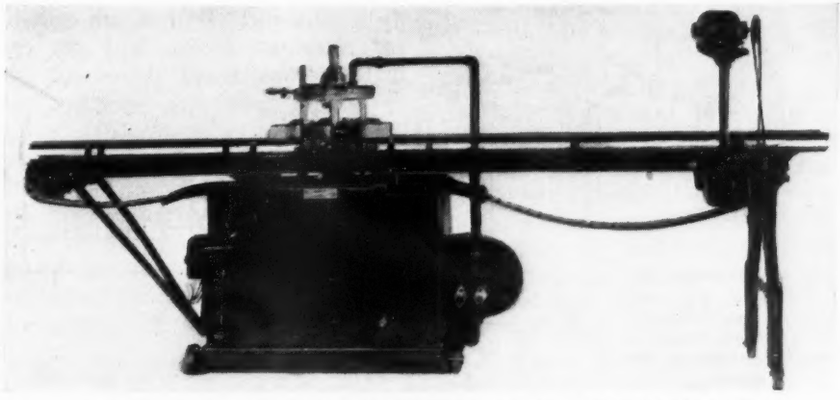
MORE than one hundred members of Canning Machinery & Supplies Association will display their equipment and products at the exposition to be held in Chicago in conjunction with the 50th anniversary canners' convention, Jan. 14-18.

Among the units for preparing raw materials for processing will be seen a new automatic cherry stemmer introduced by Urschel Laboratories. This machine reduces to a minimum the danger of bruising the fruit and turns out 750 to 1,000 lb. an hour. Chisholm-Ryder Co. will show its new continuous-feed bean snipper, which has a minimum capacity of 1,000 lb. an hour and which gages the bean by its own taper.

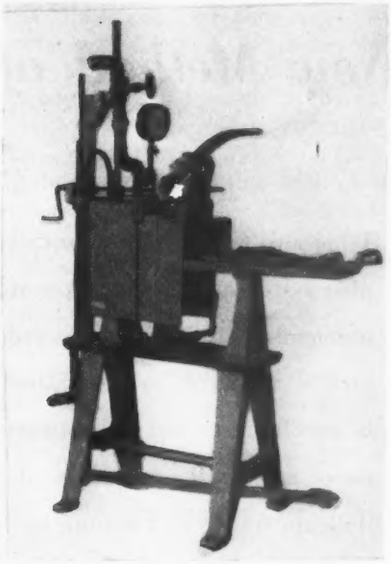
In the line of cooking equipment will be displayed a steam-jacketed kettle with an agitator that operates on a new principle. Developed by Lee Metal Products Co., Inc., the agitator scrapes the jacket of the kettle while a center wing nut (not shown in the illustration) remains stationary. This retards the circular motion and sets up cross-currents which thoroughly mix the product and cut down cooking time. Pfaudler Co. will display its latest 1,000-gal. glass-lined tomato process cooker equipped with a new single-header, rapid-heat, cooking coil. It will reduce 650 gal. of pulp to 250 gal. of catsup in 30 minutes.

Lines of corrosion resistant cooking kettles will be seen in the booths of Aluminum Cooking Utensil Co. and International Nickel Co., Inc.

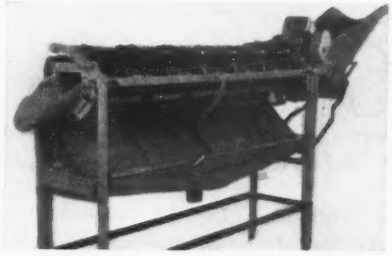
A new conveyor type filling machine for handling semi-liquid products is to be shown by Karl Kiefer Machine Co. Ayars Machine Co. will display for the first time a seven-pocket string bean and tomato filler and a twelve-valve rotary syruper. The filler is designed to prevent crushing of whole tomatoes. A machine for dispensing an accurately controlled amount of bulk salt into cans has been introduced and will be shown by A. K. Robins & Co., Inc.



Conveyor type filler for semi-solids, made by Karl Kiefer Machine Co.



White Cap Co.'s hand-operated vacuum sealing machine.



Cherry stemmer introduced by Urschel Laboratories.

Among the new closing and sealing machinery at the exposition will be a new hand-operated vacuum closing machine made by White Cap Co. It effects a vacuum up to 27 in. and makes 25 seals a minute. An automatic machine for applying screw caps which has a built-in "micromatic" speed control and handles from 45 to 75 units a minute with only two capping heads, is to be exhibited by U. S. Bottlers Machinery Co. Aluminum Seal Co. will show for the first time its new type RB sealing machine which will handle bottles from 3 in. to 12 in. in height and will operate at a speed of 135 bottles a minute.

No canner will want to miss the exhibit of Sprague-Sells Corp., as it will include several new and improved machines.

To gain access to the exposition, it is not necessary to be a member of any of the canning associations. Anyone with a legitimate interest may see the show.

New Method of Filtering Honey

Permits Retention

Time and temperature control plus systematic preparation of materials and equipment used give a finished product that is much improved in appearance and still possesses its delicate flavor and aroma and all its nutritive qualities.

ONLY recently has a rapid or "flash" method of processing honey to obtain a sparklingly clear appearance without loss of natural flavor become one of the technological accomplishments in the better processing of foods.

In its study of the problem, the Carbohydrate Division, Bureau of Chemistry and Soils, discovered that, even at comparatively moderate temperatures, honey was extremely sensitive to injury if heated for an extended length of time. There was a loss in the more volatile constituents upon which the aroma and delicate flavor depend.

Yet the presence of finely divided particles of suspended matter and, in many cases, of minute air bubbles produces a distinct cloudiness in honey that detracts from its general appearance. Also, these substances are primary factors in the formation of surface foam and scum layers and appear to play a part in hastening granulation of bottled honey.

The new method, in brief, consists in mixing homogeneously a small proportion of an inert filter aid with the honey, passing the mixture through a metallic coil immersed in water maintained at a temperature of 140-160 deg. F. and then through an inclosed filter press maintained at approximately the same temperature to prevent cooling of the honey as it enters the filter. The honey is then ready for bottling.

During filtration the particles of suspended matter and minute air bubbles are removed along with the added filter aid. When processed in this manner honey becomes quite clear and sparkling, in contrast to its usual dull and turbid appearance. In addition, there is no tendency for formation of scum in the bottle.

This method of processing honey has been tested on a semi-commercial basis in a small plant with equipment arranged as shown in Figs. 1 and 2. Tank *A* serves as a supply reservoir where large air bubbles and the coarser suspended solid material are allowed to rise to the surface. On an industrial basis it would likely receive the honey from the melters. *B* is a mixing tank in which the honey and filter aid are thoroughly mixed by the slow-speed agitator, *C*, rotating at approximately 25 r.p.m. It is necessary to fill *B* above the top paddle before the mixing is started, otherwise air will be incorporated with the honey. After thorough mixing, the filtration operation is started. The mixture flows by gravity to the rotary pump *F*, and is pumped through the aluminum heating coil, *D*, immersed in a bath of warm water. Temperature of the water is maintained, with agitation throughout the filtering operation, at a few degrees above the temperature to which the honey is to be heated (140-160 deg. F.) by means of a small steam coil. Thus the honey is heated to filtration temperature in about six minutes. From the heating coil the honey is forced into the filter press, *E*, where it is made ready for bottling as it flows from the press. Total elapsed time during which the honey is in process of being filtered, including the time of heating in the coil, is approximately 15 minutes. At the end of the operation, the press is opened and the coil drained through *H*. In practice a single tank could serve as a mixing and feed tank.

When the honey is being pumped cold the rotary pump should not rotate at a speed greater than 300 r.p.m.; the speed and capacity should be chosen so that the initial filtration pressure is below 5 lb. per square inch, with the final pressure between 50 and 60 lb. per square inch. Also the piping and heating coil between the pump and press should not slope downward at any point, but instead have a gradual upward slope to avoid air pockets in the line.

A suitable press for filtering honey by this method is a 2-eye, closed delivery plate and frame press having the feed in the lower corner and the discharge in the opposite upper corner. Plates and frames should be made of material not corroded by honey (aluminum works satisfactorily). One-inch frames are suitable for filtrations in which ½ per cent diatomaceous earth, based on the

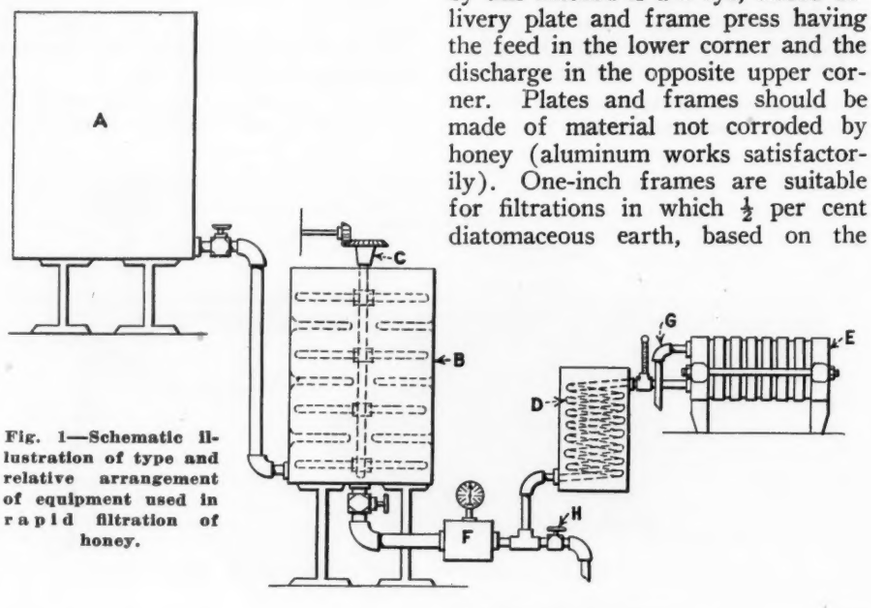


Fig. 1—Schematic illustration of type and relative arrangement of equipment used in rapid filtration of honey.

*Abstract of paper read before the Division of Sugar Chemistry at 88th meeting of American Chemical Society, Cleveland, Ohio, Sept. 10-15, 1934.

By R. E. LOTHROP and H. S. PAINE
U. S. Department of Agriculture, Washington, D. C.

of Natural Flavors

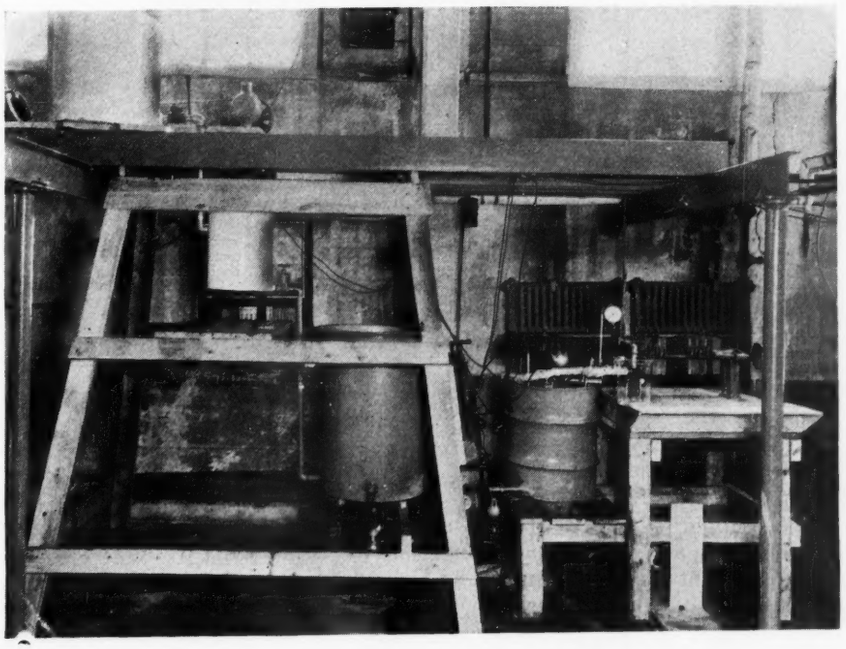


Fig. 2—Small-scale production setup in T. Shriver & Co. plant, Harrison, N. J. Rotary pump is hidden by leg of upper floor support and filter press is uncovered and opened up to show construction design. In operation press is inclosed to maintain uniform operating temperature.

weight of the honey, is used as a filter aid. At the end of a filtration cycle of 4 to 5 hours, the frames are completely filled with cake. A light cotton filter cloth of fairly open texture should be used.

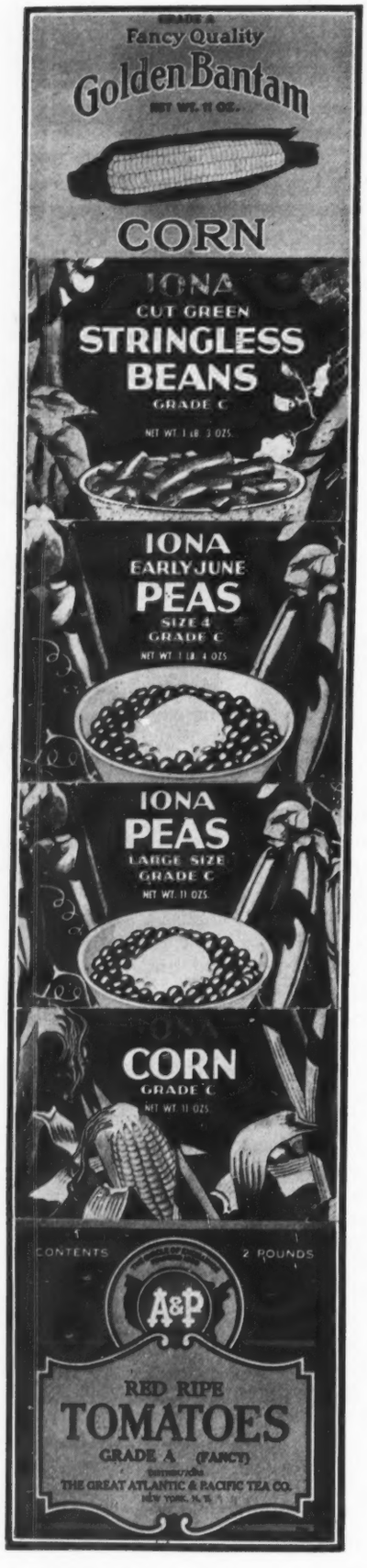
Only a rapid filtering grade of diatomaceous earth[2] can be used. For a high degree of clarity, most types of honey require the use of filter aid equal to about ½ per cent of the weight of honey filtered. When this proportion of filter aid and a temperature of 140 deg. F. are used, the average filtration rate is nearly 3 gal. per square foot of filtering area per hour. On this basis 2,500 to 3,000 lb. of honey can be filtered daily—about 4½-hour filtration period—through a 12-in., 12-chamber filter press with filtering surface of 20 sq.ft.

Mixing of the diatomaceous earth and honey requires special care to avoid introducing considerable quantities of air into the honey. The dry filter aid cannot be added directly to the honey. It must first be prepared in the form of a soft cake by suspending the required quantity of diatomaceous earth in water, bringing it to a boil to drive out air which is adsorbed on the surface of diatomaceous earth particles, and then pouring the suspension on a round vacuum filter containing a porous bottom covered by a piece of filter cloth to remove the excess water. The suction should be stopped just as the water layer disappears into the surface of the cake before any air is drawn in. A honey syrup consisting of four parts honey and one part water is poured over the cake immediately and the suction continued until the layer of honey syrup just disappears into the surface. The quantity of honey syrup usually sufficient to replace the water in the cake without any loss of honey syrup is approximately three times the weight of the filter aid. In this way an appreciable dilution of the honey is avoided and no loss is incurred, as the honey contained in the prepared filter aid is incorporated in the mixing tank when the soft cake is added to the honey in the mixing tank and dispersed by means of the slow-speed agitator. It is important that the filter aid be thoroughly and uniformly distributed throughout the honey before the filtering operation is started.

From results obtained through operation of the small plant, costs of processing honey by this method are estimated to range from 12 to 25c. per 100 lb., depending on the clarity desired and the quantity of honey filtered daily. In general, the larger the quantity to be filtered, the lower will be the unit cost. Almost half of this cost results from loss of honey in the press cake. Some possible use for the honey remaining in the cake may yet be found, but until such time, use should be made of the smallest proportion of filter aid that gives the desired clarity.

In honeys having an original turbidity less than average, good clarity can be obtained by using proportionally less filter aid, thus reducing cake losses and obtaining a speedier filtration rate. Because of large differences in behavior of the various types of honey, filtration rates vary considerably and are influenced by such factors as type of flora present, density of the honey, and the nature and quantity of the suspended matter. Tupelo honey, for example, filters much more slowly than does clover honey of equivalent density, illustrating that it is not always possible to specify the exact proportion of filter aid to use to obtain the desired degree of clarity, or to predict the exact rate of filtration. In general, however, light-colored honeys, such as the clovers, orange, sage, mesquite, alfalfa, and fireweed, of approximately normal density, will be well clarified at an average filtration rate of approximately 3 gal. per square foot of filtering area per hour over a 4 to 5-hour filtration cycle, when filter aid equal to 0.5 per cent of the weight of the honey and a filtration temperature of 140 deg. F. are used. By increasing the filtration temperature to 160 deg. F. an increase of approximately 25 per cent in filtration rate is obtained. The proportion of filter aid will range between 0.25 and 0.5 per cent of the weight of the honey filtered; 0.5 per cent is considered the upper limit.

[2] "Hy-Flo Super-Cel," manufactured by the Johns-Manville Corp., New York, N. Y., or "Dicalite Special Speedflow," manufactured by the Dicalite Co., New York, N. Y., or filter media of similar characteristics.



A.&P. "experiments" with A, B, C, labels without the aid or benefit of new codes or new laws. Other chains propose to make it mandatory eighteen months after the compulsory provisions are in the codes.

Keeping Up With the

Labeling Controversy

TWO or three different aspects of the labeling controversy, depending on one's viewpoint, are now before the public.

The canners are sticking for their own descriptive method (F.I. Dec. 1934, p. 543). A.&P. has printed a month's supply of labels for corn, peas, tomatoes, and stringbeans, using A, B, C, quality designations. The executive committee of the Food & Grocery Chain Stores of America, Inc., has come out with a recommendation that the terms "Fancy," "Choice," "Standard" and "Sub-Standard" shall be used on labels.

The canners have checkmated Armin W. Riley of NRA by releasing the results of a consumers' survey made in Canada which contradicts the repeated declaration that the Canadian label-grading system is of demonstrated practicability and worthy of duplication in the United States.

Further complicating the controversy, the Bureau of Home Economics of the U.S. Department of Agriculture put out a press release on Nov. 28 entitled "New Labels on Canned Foods." It was straight out-and-out propaganda for the A.&P. chain. Whereupon the National American Wholesale Grocers Association raised such a row that the release was canceled and a slightly modified one substituted for it. The row did not stop there for the wholesalers and the National Association of Retail Grocers are demanding that an agency of the government must cease prejudging the case and likewise must stop urging the public to trade at A.&P. stores, the wholesalers' protest going clear to the White House.

As a matter of fact, what A.&P. has done is to agree to make a "test" of A. B, C, label grades at the request of Paul Williams of the Bureau of Agricultural Economics. The standards to be used in making the test are not the recently withdrawn B.A.E. standards but, according to A.&P., are to be only the general trade concept of these qualities. In other words, they cannot be enforced, and A.&P. does not anticipate any trouble from that score. The supply of labels, some of which are shown in these pages, are stated to be only a 30-day supply. A.&P. does not know whether a 30-day test will prove anything or not. Apparently the Bureau of Home Economics was doing its part of the test by urging housewives to trade at A.&P. stores, although the name A.&P. was not actually mentioned

The Food and Grocery Chain Store recommendation called for a quality grade designation on the label, using the terms Fancy, Choice, Standard and Sub-Standard based on "Standards officially promulgated prior to the date of this report by B.A.E.," for tomatoes, cream style corn, whole grain style corn, peas, snap beans and grapefruit. Those items represent "approximately one-third of the total pack of canned foods." However, the foregoing reference to B.A.E. standards appears to refer to those which have been withdrawn for revision (F. I. Nov. 1934, p. 484). Right now there is considerable doubt about its actual meaning.

Non-A.&P. chains favor making

Both labels cover the same quality. No descriptive labels are yet in commercial existence but this comparison shows something of what may be expected if this system becomes effective. A, B, C, looks simple, but read what has been found about Canadian experience with symbolic grades.

their grades compulsory eighteen months after insertion of the new provisions in the code. None of them are using these grades now, while A.&P. is actually doing it by the A, B, C, method.

By far the most telling argument in favor of compulsory grades on labels has been the recital in code hearings of the glories of the Canadian system that has been in force for sixteen years. The canners acting on the advice of Consumers Advisory Board, made an intensive study in Canada. They engaged General Marketing Counselors, Inc., of New York to do the job. That impartial organization did not ask for the Canadian administrative officers to appraise their own work. Nor did they go to the canners. Instead they went to the housewives, in a number of cities, because the whole movement is said to be for the benefit of the consumer. And what they found there just about ruins the happy belief that the Canadian system is a huge success.

"Even though Canadian canners have been required for the last sixteen years to show government grades on canned foods," said Mr. Jean F. Carroll, president of General Marketing Counselors, "the system has not resulted in making Canadian women familiar with the different grades of canned fruits and vegetables. We are sure that this is the true situation, for we went into all classes of homes and spent enough time interviewing each woman, to be sure we knew how much knowledge she had regarding grades.

"In the provinces of Ontario, Quebec and Manitoba, only one woman out of every four has been made conscious of the fact that there are grades on the labels of the Canadian canned foods that she buys, and this is the situation in spite of an educational campaign which the Canadian Government has been conducting to teach women to know grades and to make their purchases by grades. Our survey revealed the further fact that not all the women who know grades actually use them as a real buying guide, for only one woman out of eight placed more emphasis on the grade than on brand and price.

"The NRA Consumers Advisory board has made so many favorable comments about the Canadian grading system that we were surprised to find that only 24 per cent of the women knew that there were grades on canned food labels."

As a part of the study made by General Marketing Counselors, canned foods were purchased from Canadian distributors and were graded by experienced Canadian commercial buyers. A wide variation was found between the grades officially shown on the labels and the grades given to the same can when the labels were removed, so that the commercial buyer would not know what official grade had been on the can. These gradings by Canadian commercial buyers showed that, as permitted by the Canadian officials, some cans were higher in grade than designated on the label. But they also showed that some cans were below the grade carried on the label, thus revealing a lack of uniformity in grading which has forced Canadian distributors to do their own cutting and grading when making purchases.

A check on the prices charged in retail stores for the various grades showed a wide spread in prices for each grade. A number of officials in Washington have had the feeling that under a government grade labeling system, most canned foods of the same product and grade would sell for about the same price, but the survey did not substantiate this belief. For example, "Choice" tomatoes in No. 2½ cans sold at 7½ cents to 15 cents in chain stores and at 8½ cents to 13½ cents in independent stores. The survey also revealed instances where "Fancy Quality" products (the highest grade) were sold for the same price as "Choice Quality" products (the next highest grade). For quite a while, the Canadian officials tried to get grocers to charge entirely different prices for the different grades, but they finally gave up the effort as being useless.

Fluid Milk in Paper Containers

Presages Reduced Delivery Costs

Insulated and refrigerated body used by the Silver Seal Dairy Products Co. to deliver milk and cream in paper containers to two chains of retail stores in the Philadelphia territory. Note the closed front of the body behind the driver and the side door for sidewalk unloading. The body is on a Dodge Bros. chassis and was built to Silver Seal specifications by FitzGibbon & Crisp. Inc., Trenton, N. J. Dry ice is used as a refrigerant.

AS THE packaging of fluid milk and cream in paper containers in place of glass bottles gains greater public acceptance, greater economies in motor truck distribution costs can be looked for.

The substitution for the heavy wooden case or even the lighter metal frame case by the still lighter corrugated paper carton, the substitution of the paper container for the glass bottle and the ability to maintain the proper temperature of the product by modern refrigerated bodies in place of the ordinary cracked ice in the cases —all points the way to the elimination of much dead weight and the adoption of a smaller and lighter vehicle for any given volume of the product.

Lighter vehicles carrying a greater pay load in proportion to their own weight may be expected to provide a lower unit cost of delivery.

Lower maintenance costs, especially as to bodies, are to be anticipated by the elimination of cracked ice in the wooden cases, and the consequent body deterioration due to water drippage and rotting of the body members and rusting of body hardware and even the chassis frame itself.

Some idea of the possibilities for the reduction of truck distribution costs by the use of paper containers and modern refrigerated bodies, using refrigerants only when the outdoor temperature is above 50 deg. F., may be gained by a comparison of the weight of wooden cases of milk, with and without cracked ice, and the same net volume of product in paper containers and a corrugated carton. A 12-qt. carton of milk in paper containers weighs 28.5 lb. and has a size 14 in. long; 9 in. wide and 10 in. high or a cubical content of 1,260 cu.in.

On the other hand, 12 qt. of milk in glass bottles in a wooden case, depending somewhat on the style and make of case, may weigh 64 lb. without ice and 84 lb. with ice and have a size 19 in. long by 14½ in. wide 11½ in. high with a cubical content of 3,168 cu.in.

The weight ratio is therefore approximately 1 to 2.25 without ice and 1 to 2.94 with ice. The cubical content of the paper carton is approximately 1 to 2.5 as compared to the wooden case.

Of course, other factors enter into the discussion of the pros and cons of the paper container and the glass bottle such as the maintenance of the temperature of the product if transferred from pasteurizing plant to distributing branch and the final delivery to retail stores or to the home. It is not the intention of this brief résumé to favor either the paper container or the glass bottle but simply to point out that with the paper container and carton, other economic factors being satisfactory, there are possibilities for greatly reduced distribution costs.

The Silver Seal Dairy Products Co., one of whose trucks is shown on this page, delivers milk and cream in paper containers from its pasteurizing plant to two chains of retail stores within 125 miles of Philadelphia.

The Silver Seal fleet, which is leased from the Madrid Motor Corp., consists of over 30 Dodge Bros. trucks of 1½ and 2-ton capacity, each with a special insulated and refrigerated body built to Silver Seal specifications by FitzGibbon & Crisp, Inc., Trenton, N. J., to maintain a product temperature of between 40 and 50 deg. F.

Industrial Pension Plans

The Case for the Insurance Company

★ Facing industry today is the problem of whether the guarantee of old age economic security should be a governmental function or underwritten by one or more insurance companies.

★ One of two alternatives can be accepted. We can either sit back and wait for the government to develop a social insurance plan and take what is given us; or we can develop our own plans for the retirement of employees on a basis fair and just to both parties, plans that are economically sound and that can be carried out. The President has intimated that any sound plans now in effect will not be affected by legislation.

By G. CHAUNCEY PARSONS
New York

OLD age pensions in industry are something new and our judgment must not be clouded by lack of previous experience. Below are presented a few pros and cons of the old age pension idea from the standpoint of government control versus private operation:

COST AND MANAGEMENT

Government: In the absence of a government plan we can only surmise what it may contain. Will cost be an estimate or a guarantee? Will we have efficiency or political log-rolling? With political domination the party then in power will have an obvious place on the payroll for faithful political workers, but we know that competition for business will be lacking. Power of taxation can always make up any difference in costs.

Insurance Company: Costs and rates can be quoted and guaranteed for a number of years. Efficiency would be high, due to competition and the close direction through boards of directors and state insurance departments supervision. Industry would know its pension costs the same as it now knows its other insurance costs.

Under either plan of operation, the pension plan should be contributory; i.e., the employee should share in the cost of providing his own pension, otherwise he will not really appreciate what is being done for him.

FINANCING

Government: So far no government or municipal pension plan operated by such government or municipality is on a funded basis to my knowledge. As a result we now have and will continue to have a steadily rising pension cost for a great number of years to come. Further, under this operation, the question arises: would the interest rates be guaranteed or would the contributions as received be invested in government securities at current yields? Obviously with no guarantee of interest return, rates cannot be figured and costs cannot be projected.

Insurance Company: With our pension costs guaranteed, business can figure the costs in advance for its pension requirements, and make allowance for them.

A sound pension plan should be funded; i.e., the pension should be bought and paid for while the worker is an active producer on the payroll. Adequate reserves should be created so that when the worker is pensioned all contributions from both employer and employee cease as far as his pension is

concerned. The pension payment is then guaranteed to the worker as long as he lives. His income will not be dependent on any further contribution or payments from any source.

With an unfunded plan, a large part of the cost is passed on to future management and future workers and becomes a charge against future dividends under future operating conditions.

Industry sets up a reserve for depreciation of plant buildings, equipment, machinery, etc., at the time it is using them. The same plan should apply to man power.

Every contribution buys a definite amount of pension. Moreover, if a merger should occur it would have no effect upon that part of the pension already paid for.

FLEXIBILITY

Government: Until the government plan is known we can only speculate on its provisions and ask if we are going to have real flexibility or are our plans to be continually subject to legislative tinkering as well as changes in administrative authority?

Are we going to have a blanket plan covering all industry or a series of plans covering individual industries? Geographic location has a great deal to do with industry's and industrial worker's requirements. Therefore, can a blanket plan best serve the interests of a particular corporation and their workers?

Insurance Company: With individual coverage for each company, it is possible to determine, from analysis of a particular company, its exact requirements. However, plans to meet these requirements are capable of alterations and modifications to meet changing conditions with little trouble or expense. This strengthens the position of the workers and company. No blanket or general plan can accomplish that.

LABOR CONDITIONS

Strikes

In case of strikes—and industry is not going to be free of them—shall we continue to contribute to the general fund or shall contributions cease by those companies affected?

Government: Is the striker entitled to a pension credit while out on strike? It is the belief of a great many that we would have to continue to contribute. This really puts a premium on poor management, as some industries are more subject to strikes than others.

Insurance Company: Obviously if the worker is on strike, no contribution would be made for his benefit, nor would there be any credit given him while he continued on strike.

Seasonal Industries

Seasonal industries present a very difficult problem in the development of a good pension plan, and it is my opinion that only by individual coverage for each particular company is it possible to work out a real pension plan which will adequately serve the best interest of the worker and the employer.

RETIREMENT AGE

Government: Under the Railroad Pension Act, the retirement age was fixed at age 65. (This act has since been declared unconstitutional, but is the only example we have of federal legislation of this type to date.)

Insurance Company: Individual plans can be made to suit the individual company or industry. Female workers can be retired at younger age. Some industries make more demands and wear out labor at a younger age than other industries. Provision for this wearing out of the man power at the right time can be made. Also management should have the option of retiring its employees earlier in individual cases.

PENSION REQUIREMENTS

Government: Again, under the Railroad Pension Act, the limit of pension was set at $120 a month and the maximum limit of salary considered was $300 a month. No such limitation has been placed in state or municipal plans.

Insurance Company: Would industry and the companies that make up industry want to place a top limit on salaries considered for pension purposes of $300 per month? Should this top limit apply to all executives and the so-called white collar group? Under the insured plans now in force, there is quite often no limitation placed even upon salaries, even of the highly paid executive.

If we are going to accomplish anything in the way of augmented buying power as a result of a pension plan, we cannot put a top limit of $120 a month on pension income upon our pensioners. The pension must be adequate for the reasonable support and well-being of our workers and not a bare minimum for subsistence only. If the worker knows that his old age is adequately provided for in relation to his previous earning capacity and effort, he is a more efficient worker and less subject to outside influence. His mind is free from worries over his future. The increase in efficiency shown by many companies having pension plans has more than met the cost of the contributions.

INDUSTRY has seemed to lack foresight on the fact that the costs to industry in establishing its own plans will be returned to them many times over merely through the buying power these pension plans will create. Is the real market for your commodity to be found in public institutions for the indigent? Is it to be found among those younger workers that are supporting or helping to support aged and penniless relatives? Have you thought of how such plans will affect the buying power now of your own workers? If they are honestly attempting to make some provision for their old age, the amount they will have to save for this will be out of proportion to their wage. If this amount can be divided between worker and employer, at the same time providing a more secure and adequate old age pension, then the buying power of that worker is going to be increased—that extra money will be in circulation. Your commodity, therefore, has a broader market.

Under an insured contributory plan, the employee is really a partner and shares in the cost of his pension by weekly or monthly deductions from his pay. This is paid to the insurance company along with the employer's contribution. Under this plan, we have a fundamentally sound financial transaction. The reserve set up for the future pension is funded out of current company earnings, i.e., during the time when the future pensioner is on the payroll and is actively working and producing, which is the correct time to buy the pension. The cost should not be passed on to future management and future employees and it should not become a charge against future stockholders.

Make Your Entries for the

New Packaging Award

A NEW FORM of award for distinctive merit in technical packaging development has been announced by the American Management Association. The award is to be conferred at the Packaging Conference and Exposition at the Palmer House, Chicago, March 5 to 8, 1935.

Of interest to all production men, the new award does not displace the Irwin D. Wolf award for distinctive merit in design, but supplements it by giving recognition to the excellence of the work of the men behind the scenes who create materials, processes and machinery, and assemble them into packages that carry the goods successfully to their destination.

Back of the new award is the philosophy that no matter how perfect may be the exterior design of a package, from the viewpoint of beauty and merchandising appeal, the package must also possess an intrinsic design—a utilitarian ability to keep the goods safe and sound or the package cannot be called a good commercial package.

Such a good package must be one that will permit the efficient handling on a modern production line or its cost will be too high. Furthermore, it must protect the goods from moisture, from insects, from drying out, from breakage, or from rancidity or whatever other technical hazards it must encounter such as physical damage, sifting, leaking, oxidation, staling, spoilage, fermentation, melting, inside condensation, "breathing"—no matter how beautiful or how homely it is.

As every factory man knows, some of the best technical features of a package are too often invisible, unnoticed or unexplained—features that only an experienced production man will appreciate. For that reason the Jury of the Award will be production men chosen from the food industry and several others which are interested in packaging. Their decision will be based on the degree to which the submitted package embodies any or all of the following factors: 1. Advance in engineering technique; 2. advance in mechanical design; 3. application of a new process; 4. utilization of a new material; 5. enhanced protection of contents.

It is highly important that entries be accompanied by statements which will tell the jury the information that should be considered in evaluating the package. Don't compel the jury to guess at what you have done.

Packages which have been placed on the market in the two-year period Jan. 1, 1933 to Jan. 1, 1935 are eligible for entry. Entries are limited to those who have a specific definite interest in the package and its success: manufacturers or distributors of the product contained in the package; manufacturers of packages or materials or equipment used in its packaging; printers, lithographers or others who contributed to the development of the package; package designers; advertising agencies.

Complete information may be obtained from Packaging Awards Administration of the American Management Association, 232 Madison Avenue, Suite 1605, New York City.

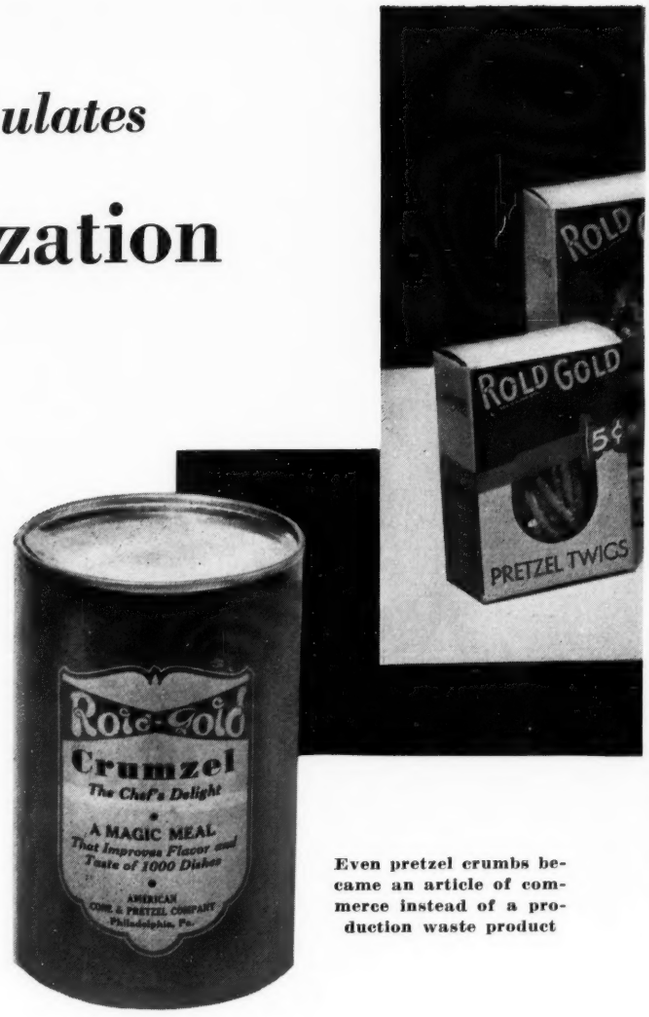
In addition to the usual clinics and addresses on the broader aspects of packaging at the Conference one day is to be set aside for the consideration of practical problems of packaging where every discussion will be of interest to men who operate plants and equipment. Details of the program will be announced in February.

Package Family Stimulates

Product Modernization

By L. J. SCHUMAKER
President, American Cone & Pretzel Co., Philadelphia, Pa.

An improved product, appropriate packaging, and smart merchandising take pretzels out of bulk commodity class and pave way for a more dependable and a more profitable market demand



Even pretzel crumbs became an article of commerce instead of a production waste product

OUR company has done some modernizing of late, but not exactly along the lines that we had formerly been taught to believe was correct modernizing.

For many years we have been studying equipment and processes which would cut the cost of production, and demands have continually been made on our capital and credit for increased capacity whether we needed it or not. Our object in increasing production was to decrease cost. In this effort we were reasonably successful, but when the depression came we found ourselves burdened with a capacity twice the size we needed.

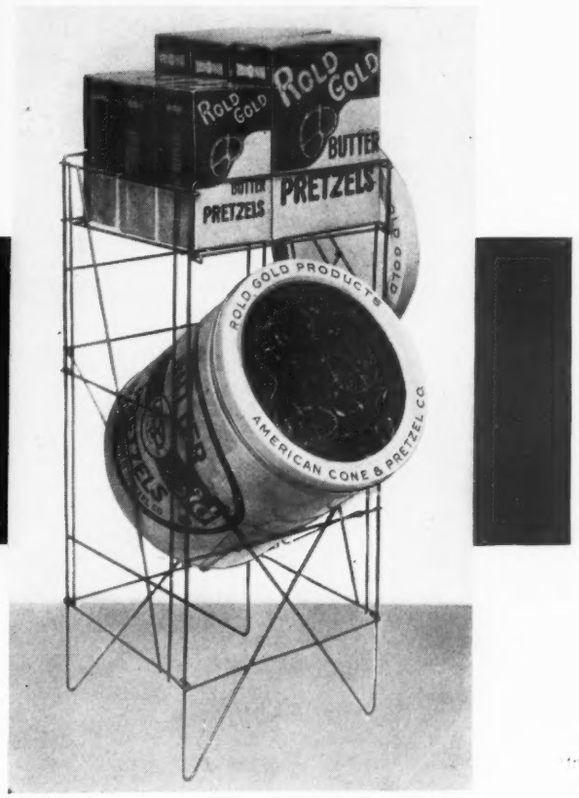
Consequently we discontinued spending money for equipment to reduce costs by increasing capacity. Practically all such equipment is based on a given rate of production, and sometimes it proves to be more expensive than the old equipment unless it is operated at capacity. For the past three years we have spent what money we could spare for experimental work with new products. We have studied our markets so that we might avoid imitating or duplicating anything now on the market. And any item selected as worthy of a place on our list of products has been made with more regard for quality and distinctiveness than for its price.

We have come to the conclusion that with all industry on a mass production basis it would take only a few plants in each industry to supply the entire country; that the country requires such plants in order that the people may have the comforts and conveniences of life at the lowest possible price. But, since there can be room for only a very few of these large businesses in each industry, the rest of us who want to continue in business must plan our operations on some basis other than that of price alone. There are some things that the majority of people will always buy on a price basis, but there are plenty of things that people will buy because they like them. We have decided to cater to consumer tastes, choice, or preference rather than to the pocketbook alone.

The longer we study the problem, the more impressed we are that in Europe there are many small factories in every line and most of them appear to be making a living; whereas in this country we are reaching a point where there are a few large companies in every line that have difficulty in making a reasonable return on their investments because of the many small companies dominated by an ambition to grow large. The latter sacrifice price to get volume, with the result that nobody makes a satisfactory living, except possibly the attorneys for the creditors, who generously continue to offer credit to any newcomer who wants to enter the field.

Since the codes came in with their reduced hours we have put in some new equipment but this has been only to meet the requirements of shorter hours and higher wages imposed by the codes, not for the purpose of in-

With a package for every pocket book "Rold Gold" pretzels were enrolled in the packaged food class with a retail price range of 5, 10, 20, 25, and 35 cents per unit



An eloquent, although silent, salesman announced to the consuming public that pretzels could be purchased in well sealed protecting packages as well as in bulk.

creasing capacity. We are more interested in developing new products and improving old ones than we are in enlarging capacity and increasing production.

Our start in that direction was really made about six years ago when we introduced our "Silent Salesman," a rack on which was displayed both bulk and packaged pretzels. This was the first attempt on the part of a pretzel baker to display pretzels in bulk and in packages at the same time.

The package in its present form is a glued, not a tuck-in, carton with the pretzels enclosed in a sealed, waxed-paper inner bag and with an outer waxed-paper wrapper. It comes in ½- and 1-lb. sizes to retail at 20 and 35 cents respectively.

More recently we introduced the small tin can package which we call the "40-count can" because it holds forty or more pretzels. It retails at 25 cents. Then followed the display or window-front package of butter pretzels to retail at 10 cents. The pretzels in this package are kept fresh and crisp through the added protection of a heavy waved-glassine bag paneled with No. 450 moisture-proof cellophane.

Three 5-cent packages—"Tiny Tims," a very small pretzel, "Pretzel Buds" and "Pretzel Twigs," both butter and cheese sticks—complete the family of packaged pretzels. We tried a 15-cent package but failed to get a favorable market response.

In Crumzel—a coined word derived from "pretzel crumbs"—we have a companion product which is packed in a canister and with a recipe book retails at 10 cents. Because of their extreme dryness and the flavor imparted by the boiling, baking, and toasting processes by means of which they are prepared, these pretzel crumbs give better results in the kitchen than do bread or cracker crumbs.

Chocolate-coated pretzels for winter bridge, caraway and poppy seed pretzels, and pretzels in the shape of fish, animals, crescents, stars, rings, and letters of the alphabet have all been added to our list of products but as yet have not been developed to any marked commercial prominence.

In the case of the chocolate-coated pretzel we have been granted patent rights not only because this product was a distinctly original idea but principally because the only way to keep a pretzel crisp in an exposed state is to cover it with a moisture-resisting coating. Our patent claims cover edible moisture-resisting coatings to keep the pretzel crisp.

These are only a few of the steps we have been taking to keep our product modernized and in consumer demand. Under present day conditions we feel that this program is more conducive to the development and maintenance of a successful business than is the building up of a large production volume just for the purpose of getting a low production cost with the hope of being able to quote a lower price than a competitor. The results we have obtained thus far encourage us.

1. Deviled-Ham Table Jar

To SUGGEST the use of deviled ham with the meal, Wm. Underwood Co., Boston, Mass., has introduced a new package known as the "table jar." To make the container distinctive and attractive, the company has taken advantage of a recent development in the use of applied color on glass made by Owens-Illinois Glass Co.

2. Paper Bottle for Milk

ANOTHER paper milk "bottle"—one that requires the dairy to have only a filling and closing machine to handle it—has made its appearance. Used by Castanea Dairy Co., Inc., Trenton, N. J., on an experimental basis, the new container is the development of the American Can Co.

Castanea Dairy purchases the paper container from the can company already set up, sterilized and hermetically sealed. A machine in the dairy plant breaks the seal, introduces the milk and recloses the container. A flap on top covers the opening in the container, and in making the seal, a mandril enters a recess in this flap and expands it.

As compared with glass bottles, the paper container eliminates handling of returns, washing of the empties and does away with breakage. It also is lighter and occupies less space in the delivery wagon. Furthermore, it gives the consumer an individual container.

3. Packaged by Request

JUST a year ago, Rockwood & Co., Brooklyn, N. Y., worked out a formula for a smooth and tasty chocolate and to this added American peppermint oil. Within two months this product outsold every bulk piece in the company's extensive line, and it was not long before the manufacturers received calls from important chain organizations which had no bulk departments for an easily handled package of these mint wafers. In answer to this demand, the company developed a double, printed, transparent cellulose bag. One pound of wafers, arranged in two stacks separated by a cardboard insert, is put into the container, and the bag is closed by stapling. For shipping, twelve of the packages are put into a celled carton. The company reports the new package to be selling very well.

4. Packages Bacon in Blocks

ACTING upon the contention that sliced bacon packaged in block form reaches the consumer in better condition than when the strips are lapped to permit display, Armour & Co., Chicago, now is putting its Star brand out in cartons. While the eye appeal of the bacon itself has been sacrificed, Armour is counting upon an attractive container and a well-known trade-mark to sell the meat.

Before the bacon is put into the carton, it is wrapped in parchment. With this wrapping and the small amount of meat surface exposed, Armour finds that the product retains its freshness, aroma and flavor to a high degree. This package also is well adapted to keeping in the domestic refrigerator.

Three-in-One Fruit Boxes

IN CONNECTION with a big merchandising drive, American Fruit Growers' Association, Medford, Ore., is using a special fiber box which contains a dozen or so fancy pears. The fruit is first wrapped in oiled paper, then in colored tinfoil and packed in green, shredded paper in an open-top container. This slides into another fiber box which fits into still another box which is sealed. Apples are also being packed in fiber boxes.

Puts Tomatoes in Carton

MANY elements of successful packaging are incorporated in a carton adopted by Sun-Ripe Tomato Co., Detroit. Printed with an attractive, vivid design which has the appetite appeal of the tomato itself, the container has good display value. By wrapping every other tomato in the box, a package is produced which permits the prospective consumer to inspect the product and which at the same time protects the tomatoes in transit. Suggesting purchases in 5 lb. units, the container promotes volume and is an easy package for the wholesaler and retailer to handle. Furthermore, it backs up the product with the name of the distributor.

5. *Cottonseed Noodles*

NOODLES containing cottonseed flour are the latest creation of Nutty Brown Mills, Houston, Tex. Introduced as a companion product to the company's cottonseed macaroni and spaghetti, the noodles are packaged in unprinted transparent cellulose bags. The bags are closed with staples which also hold in place a printed paper hood.

6. *Packs Mustard in Shaker*

SOMETHING new in a container for condiments has been adopted by King-Fuller Co., Chicago, Ill. It is a "lighthouse" jar having a small, cork-closed opening in the top through which the product may be dispensed in controlled amounts by shaking. Having only the small opening and being equipped with a non-corrosive closure, the container not only is highly sanitary but it protects the mustard against exposure to the air and subsequent hardening. Furthermore, the shaking necessary to dispense the product keeps it of a uniform consistency. The container may be used for sugar and other items when empty. King-Fuller plans to use the lighthouse not only for prepared mustard but for sauces, free-flowing dressings, and ketchup.

7. *Gold Foil Sausage Box*

A BOX covered with gold-colored foil and decorated with red stripes and black lettering distinguishes the pure pork sausages made by Jacob Forst Packing Co., Kingston, N. Y. Before being put into the box, the sausages are wrapped in greaseproof paper of a parchment type. The package contains 1 lb.

8. *Tool Kit for Hostess*

FOR consumer convenience and, incidentally, to promote sales, Giroux Co., Inc., New York, has brought out a package containing lemon juice, orange juice, rock candy syrup, orange bitters, cherries, Spanish olives, grenadine syrup and cocktail bitters—all the special ingredients needed to mix a cocktail. The bottles are packed in a multi-partitioned corrugated cardboard box and are delivered to the consumer in the original package. Hinde & Dauch Paper Co., Sandusky, Ohio, makes the box.

Burnt Onion Sauce

PURE onion juice packaged in a 4-oz. glass bottle of consumer size has been introduced by Giroux Co., Inc., New York, N. Y. Labeled "Burnt Onion Sauce," the product is simply onion juice which has been subjected to a heating process. It contains neither water nor vinegar, and it is characterized as having the flagrant flavor of the cooked onion without any offensive odor. The onion sauce is for use in flavoring gravies, steaks, roasts, and what-not.

All-Season Easter Package

HAVING an article which is sold the year around but which enjoys a large proportion of its total sales at Easter time, R. C. McAteer Co., Pittsburgh, has worked out a method of packaging compatible with both the general and seasonal sales. For year-round distribution, the "Food Tints" manufactured by this company are put up in a small carton containing six different colors in individual envelopes. At Eastertime, the demand for coloring materials is capitalized upon by packing several of the small packages in special cartons. Any stock remaining on hand after Easter is removed from the carton and moved in general sales.

It Finally Has Been Done

A SUGAR refiner has adopted for wrapped sugar tablets a tear-open tab that enables diners to get at the sugar without undue fumbling. Credit for this long-needed development goes to American Sugar Refining Co., New York, manufacturers of the Domino brand.

Frog à la Queen

AS A companion product to its canned frog legs, American Frog Canning Co., New Orleans, has brought out "Frog à la Queen" in tin cans. This unusual food is prepared in a manner similar to chicken à la king and is served in the same way as that product.

PACKAGING EQUIPMENT AND SUPPLIES

Protect Against Light Damage

Known as Sylphrap R.R. Old Gold and Sylphrap U.V.R. two new fully transparent, light-protecting wrappings are available to packers of fat and essential oil-bearing products and other foods sensitive to light.

Developed and marketed by Sylvania Industrial Corp., 122 East 42d St., New York, N. Y., these wrappings are claimed to retard rancidity, loss of flavor, aroma, or color, and transfer of moisture.

Sylphrap U.V.R., practically color-free when viewed direct, has a slight violet cast. It is purported to be resistant to ultra-violet rays and protective to such light-sensitive foods as butter, lard, meats, cheese, nuts, baked goods, fruits, cereals, tea, coffee, confectionery and flavoring materials including spices.

Where a longer period of protection against rancidity, fading, and loss of aroma is wanted, Sylphrap R.R. Old Gold is recommended. It, as its name indicates, is of "old-gold" yellow color and is resistant even to rays of visible light having a wave length comparable to the "old-gold" shade of yellow. Special attention is called to its protection to doughnuts, cakes, cookies, crackers, potato chips and nuts against rancidity; to tea, coffee and fruits, dried and fresh, against loss of color and aroma; to flavors against development of terpene odors; and to meats. Both of these wrappings are available in plain or printed rolls or sheets, bags, envelopes or window cartons and in "regular" or "moisture and grease-proof" grades.

Paper-Shredder

Packers of fruit, vegetables, candy, canned goods, preserves and other food products who use shredded paper, or other cellulose materials for packing purposes, will be interested in a new machine developed by Mitts & Merrill, Inc., Saginaw, Mich., and called the "Air-Fluff" paper excelsior shredder.

This machine which is said to be suitable for shredding newspaper, magazines, oiled, waxed or tissue paper, cellophane and other similar materials, has a capacity ranging from 400 lb. per hour for excelsior $\frac{1}{8}$ in. wide, up to 1,200 lb. per hour for $\frac{3}{8}$ in. excelsior. The machine is driven by an individual motor, mounted on the machine frame and driving either through a variable speed mechanism or a step pulley mechanism. It consists of a large disk on the face of which are set knives against which the material to be shredded is fed. The cut excelsior is delivered in a pile from the base of the machine ready for use in packing.

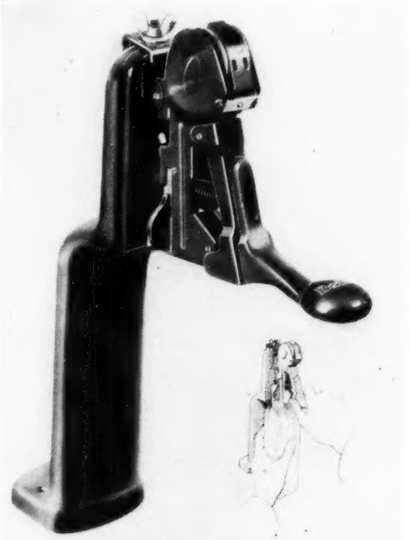
This machine occupies a floor space of 4 ft. square and its total weight is 2,000 lb.

Rust-Resisting Stitching Wire

For meeting the needs of packaging of lard, butter and similar products, which have a tendency to corrode ordinary stitching wire, Acme Steel Co., Chicago, Ill., has developed their "Blue Label" "Silver-Stitch" special stitching wire for fiber boxes and containers.

This wire which is supplied in one piece 5 and 10 lb. coils and is of standard width thicknesses and temper, is specially treated in order to give it corrosion-resisting qualities. As a result, the manufacturers claim that their product overcomes this problem and prevents the formation of blemishes from rust and corrosion on the inside of shipping containers as well as on the outside where the wire is exposed to atmospheric moisture.

Paper shredder.



Bag fastener.

Verticle Bag Fastener

For the hand fastening of bags that must be stapled while in a vertical position, Bates Manufacturing Co., 20 Vesey Street, New York, N. Y. has recently developed a new special stapler. This machine makes its own staples from a roll of rustproof wire, as many as 5,000 staples being produced from one loading. It is claimed that the machine will insert staples within $\frac{1}{8}$ in. of the product in the bag, and that it is easy to operate, will not jam or clog, and is inexpensive as to cost of refills.

New

PACKAGING CATALOGS

Cellophane Hoods—For milk bottles and similar packages, in striking colors, are placed by either the semi-automatic or the automatic hooding machines, described by Package Machinery Co., Springfield, Mass., in an illustrated folder which gives specifications for the two machines.

Bottle and Jar Closures—Of the Anchor D and Amerseal designs, are the subjects of two new illustrated folders published by Anchor Cap & Closure Corporation, Long Island City, N. Y.

Beer Boxes—Of corrugated paper, are described by The Hinde & Dauch Paper Company, Sandusky, Ohio, in a booklet that covers partitioned boxes with long and short key pieces, and with pads and full-height cells; six-bottle home delivery boxes with self-locking tops; partitioned delivery boxes with hand holes and with self-locking lids; and flat beer boxes with serpentine partitions or alternate Climax bottle wrappers.

Shipping methods and storage conditions also help to cut down ravages of insects and other pests in food plants.

Container Choice

Aids In Pest Control

By HARRY STINER
Los Angeles, Calif.

In this and succeeding articles, FOOD INDUSTRIES' series on pest control is brought to completion by a study covering the requirements of some major food commodities as to containers, shipping and storage.

EACH group of commodities—each individual commodity, to a large extent—has its own storage and handling requirements and its peculiar pest control problems. In consideration of these problems, the commodity or group will be treated from the following standpoints: container choice, shipping methods, storage requirements, and pest control.

Cereals and Flours

CONTAINERS

For arrowroot flour, bakers flakes, corn flour, corn meal, corn flakes, doughnut flour, farina, graham flour, rice flour, potato flour, soya flour, white flour, and whole wheat flour, use white cotton bags.

For bran, oatmeal, hulled oats, rolled oats, rolled wheat, and steel-cut oats, use jute bags.

For corn flakes, use fiberboard boxes.

SHIPPING

Cereals and flours should always be shipped in clean, dry vehicles, free from odors and insects. Inspection should always be made at the door for insects on outside of bags. Suspiciously soiled bags should be opened and examined for moisture, insects and mites.

STORAGE

Store in a clean, cool, *dry* place. Containers should always rest on skids, at least 6 in. above the floor, and must never be placed in contact with outside walls. Whenever possible, especially for long storage, bags should be shored at intervals, and as much air space as possible left between them. Closely packed bags of moist, or heavily infested cereals, are subject to spontaneous combustion if not moved frequently.

PEST CONTROL

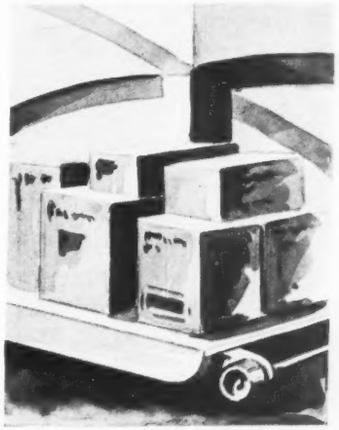
Flours often leave the mill with the beginnings of infestation present; also, being in comparatively open-mesh bags, they are often attacked by mites and insects while in transit. Many of the insects that feed on flours also feed on other commodities and can easily crawl or fly from one to another. Rats and mice attack all cereal products, also tear or gnaw the containers and build nests among them. Elevation of containers on skids does much to protect them from rodents.

Mites often attack cereals, especially when stored for long periods, and do much damage. When products are infested with mites, the containers should be first fumigated or heat treated, then their contents sorted.

A large variety of moths and beetles attack cereals and flours in storage; however, as stated previously in this series of articles, under the descriptions of insects, the recommended control methods are about equally effective on all alike, and should, therefore, be chosen to suit the commodities to be treated.

Whenever insects are found on the outside of containers, the contents should be immediately inspected. If the material proves to be infested, it should be fumigated at once, and cleaned, if possible. If cleaning cannot be done, the material should be diverted to other uses. When infested cereals are received at a plant, or are removed from storage, the spaces should always be sprayed.

Flours and cereals seldom leave the



mill in moldy condition, but quickly develop mold if they become moist during transit or storage. Moisture causes all of these materials to form ill-smelling, fermented and moldy lumps which render them worthless. Moisture also causes spontaneous combustion.

Fruits

CONTAINERS

For fresh fruits, various containers to suit the variety.

For California raisins, fig paste and puffed raisins, use paper-lined fiber boxes.

For California dried figs, imported raisins, dried apples, dried apricots, dried dates and dried prunes, use paper-lined wood or fiber-board boxes.

For imported dried figs, use cotton-lined jute bags.

For Greek dried currants, use jute bags.

For date paste, use wood tubs.

SHIPPING

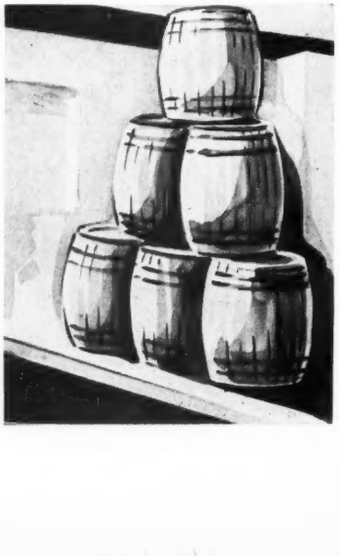
Most fresh fruits are purchased locally. When obtained at a distance, they should be transferred in refrigerated vehicles. Dried fruits should all be shipped in vehicles free from insects and moisture. If containers are "leaking" or are unclean when received, contents must be inspected. When dried fruits are free from insects or mites and are taken from ordinary storage, they may be shipped considerable distances at prevailing temperatures; but when taken from cold storage for shipment they should be carried under refrigeration and not permitted to rise over 15 deg. F. during transit, and, on arrival,, should be immediately placed in their former storage temperature.

STORAGE

In general, fresh fruits may be considered as highly perishable. The usual life of ripe berries, peaches, plums, cherries, bananas and like fruits without temperature protection is but a few days. Even then, unless frozen, they can be held only a few weeks. Frozen fruits, will keep indefinitely, but unless encased in ice, or an air-tight container, are subject to a fairly rapid dehydration; also, there occurs in all frozen moist fruits a disruption of cellular structure by expanding ice crystals which, upon melting, leaves the fruits with damaged cellular structure, and although the flavor and food value may not be changed, decay is more rapid. Good, hard apples may be held at 31 to 32 deg. F. for 8 to 10 months, but these are an exception and even then must be carefully selected. Green bananas may be held 7 days at 50 deg. F. and ripened at 58 to 72 deg. F. for an additional week, but should be used promptly at the end of this period. As most of the fresh fruits used in food plants are purchased locally, the problem of storage is seldom a factor; however, when this is not the case, a temperature between 35 and 45 deg. F. may be used to keep them satisfactorily for periods of less than three weeks, and a freezing temperature used for longer periods.

Dried fruits are very susceptible to infestation by storage pests, and also to the absorption of moisture. When they are properly prepared, the moisture content is low enough to check the normal processes of decay, but if stored unfrozen in moist atmosphere, even at 32 deg. F., they readily pick up enough moisture to cause decay to result. Also, when dried fruits are removed from cold storage, moisture collects on their surfaces from the warmer air, and may cause mold and decay. Every effort should always be made to keep the air reasonably dry and the temperature constant in all dried fruit storage rooms. No dried fruit container should rest directly on the floor of the storeroom, and fiberboard boxes, or bags, should be placed on skids.

Dried fruits may be kept in normal-temperature storage provided it is reasonably dry and they are otherwise protected from the ravages of storage pests. Where this is not possible, they should be placed in cold storage which, if kept reasonably dry and held between 30 and 32 deg. F., will preserve them adequately.



PEST CONTROL

Dried fruits are attacked by many forms of storage moths and beetles, mites, molds and rodents; and, when very moist, by bacteria and yeasts.

Moths usually appear in the fruit as pink or white worms, from very small to over $\frac{1}{2}$ in. long, or in the pupal state as brown, seedlike forms, about $\frac{3}{8}$ in. long, encased in a white, silken cocoon. In addition to the frass they make, the worms also spin a silken thread as they crawl about, which in time forms the white web so often seen in infested materials.

Beetles are usually of the smaller variety, $\frac{1}{8}$ in. or less in length. They are mostly brown or black, quite active, and often occur in great numbers. They spread rapidly when disturbed and are difficult to control.

The mites are the microscopic spider forms, but because of their enormous fecundity are usually as destructive as insects—and as undesirable. Besides destroying fruit they produce a fine brown powder in and over it.

Molds develop rapidly in normal storage on most dried fruits if their moisture reaches an abnormal percentage. They are usually visible in the form of various colored velvet-like growths and are accompanied by a foul, musty odor which carries on through the later processes of decay.

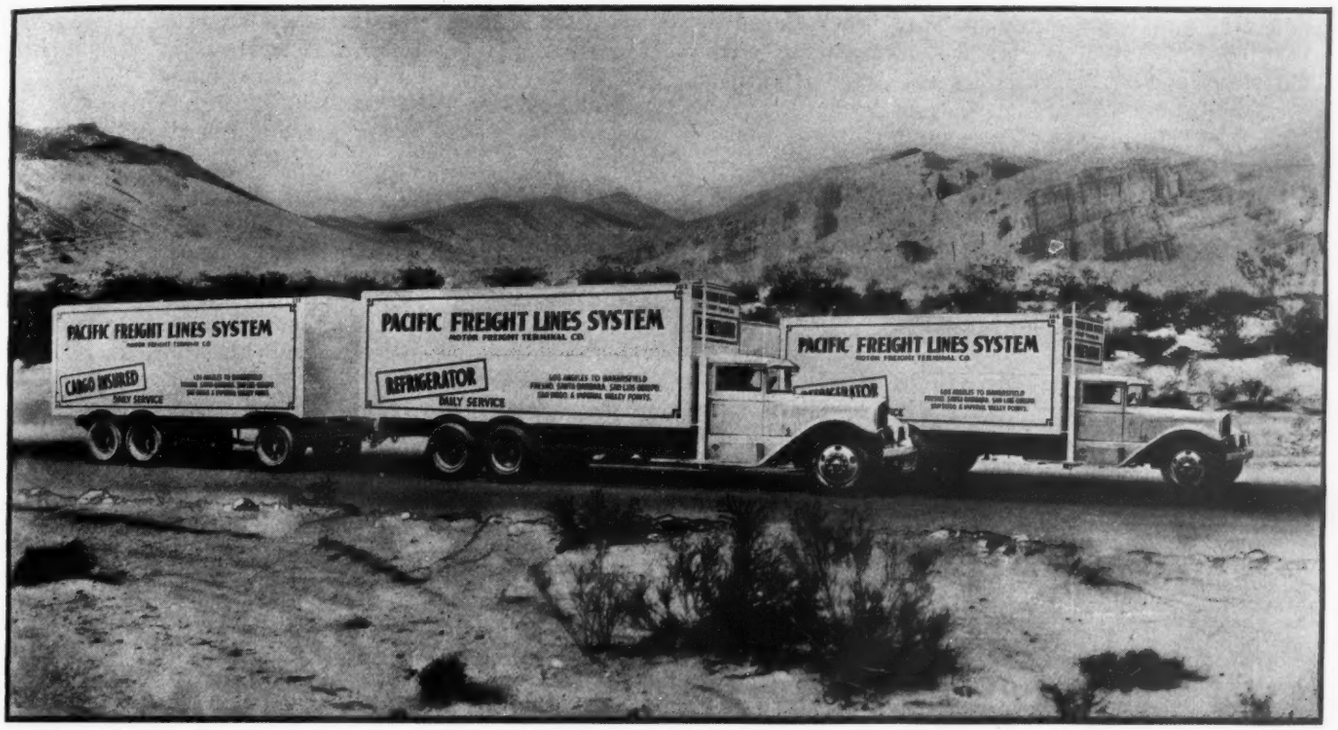
Bacteria and yeasts—the principal organisms of decay and fermentation—develop mainly after the affected part becomes unduly moist. In a cold storage temperature of 30 deg. to 32 deg. F., however, their progress is greatly retarded.

Rodents—either rats or mice—are particularly fond of dried fruits.

When possible, dried fruits should be stored in a separate compartment. If in normal temperature it should also be made gas-tight so that periodic fumigation can be given. Any of the gases except sulphur may be safely used for this purpose.

Small infestations of insects or mites may often be satisfactorily removed for manufacturing purposes by a thorough washing just previous to using, but heavy infestations should always be destroyed.

The formulas for sprays, fumigants and insect poisons referred to in this article were given on pages 113, 144, FOOD INDUSTRIES, 6, 3, March, 1934, and pages 160, 161, 162, FOOD INDUSTRIES, 6, 4, April, 1934.



Two diesel-engined truck-trailer trains used in the Far West for intercity shipment of food products and other goods between Los Angeles, Bakersfield, Fresno, Santa Barbara, San Luis Obispo, San Diego and Imperial Valley points. The trucks are Sterlings powered with Cummins diesels as described in the accompanying text.

Fuel Economy Features

Diesel Trucks

in Food Field

FUEL ECONOMY has led many companies in the food field recently to purchase motor trucking equipment powered by diesel engines. One of the latest to purchase first one and then a second Sterling diesel-powered tractor is C. J. Fayen of New York City.

Each of these tractors is used with a closed body semi-trailer to haul cases of milk from the Fayen creamery at West Pawlet, Vermont, to New York City, a distance of 240 miles. The gross allowable weight of the combination is 72,000 lb. and the pay load, 25 tons or 50,000 lb.

The round trip of 480 miles is made three times a week and for the first 35,000 miles of operation, a total of 5,000 gal. of No. 3 furnace oil was used as fuel. This is at the rate of 7 miles to the gallon of oil.

At a purchase price of 7 cents per gallon, the fuel for the 35,000 miles cost $350, or at the rate of 1 cent per mile. A conventional gasoline tractor on the same run with a slightly smaller load showed a gasoline cost per 480-mile round trip of $22, as compared with $4.80 for the diesel.

The difference in fuel cost of $17.20 per trip, or $51.60 per week for three trips, is expected to show a considerable net reduction in haulage cost and to more than offset, within a short period, the added first cost of the diesel tractor.

According to location and distribution facilities, the cost of No. 3 furnace oil used as fuel varies from 4½ to 7 cents per gallon. In most states there is no fuel tax, corresponding to the gasoline tax, on the oil used by automotive diesels.

Although there is some doubt as to whether the federal gasoline tax is assessible on fuel oil, it has not been applied in many cases. A continued increased use of diesels in highway transportation work will undoubtedly subject the new type of power plant to the action of legislatures seeking some new motor vehicle tax that is easy to collect.

Without going into the technical phases of design, it may be seen from the accompanying illustrations that the diesel-powered trucks look practically the same as those with conventional gasoline engines. Both types of engines are of the same general outlines and fit under the ordinary engine hoods. Only when the hood is lifted and the absence of spark plugs and carburetor is noted, and their substitution by piping and accessories that would look unusual on a gasoline engine, does the fundamental difference in design become apparent.

Diesel engines of large size and horsepower have been used in seagoing motor vessels for many years

and also in pleasure yachts. They have been employed also for stationary power and electric current generators and more recently in some of the new streamlined, high-speed, light-weight railway coaches and trains.

At least three different makes of diesel engines, the Cummins, Hercules and Waukesha, are now offered on the market for highway transportation work. One of the makes, the Cummins, is offered by twelve truck manufacturers in a variety of truck and tractor models.

The Cummins diesel in the Fayen tractor furnished by the Sterling Motor Truck Co., Inc., Milwaukee, Wis., is also supplied to the following truck manufacturers for use in various models: Four Wheel Drive Auto Co., Clintonville, Wis.; Gramm Motors, Inc., Delphos, Ohio; Kenworth Motor Truck Corp., Seattle, Wash.; Kleiber Motor Co., San Francisco, Calif.; Linn Mfg. Corp., Morris, N. Y.; Robt. Gotfredson Truck Co., Detroit, Mich.; Ward LaFrance Truck Corp., Elmira, N. Y.; Indiana Division of the White Co., Cleveland, Ohio; Moreland Motor Truck Co., Burbank, Calif.; LaFrance-Republic Sales Corp., Milwaukee, Wis.; and Condor Motors, Inc., Chicago.

The diesel truck engine differs from the conventional engine in that it burns low-grade, non-inflammable fuel instead of gasoline; has no carburetor, spark plugs or electrical ignition system and mechanically is not subject to the troubles due to the failure to function of any part of the electrical ignition system.

The torque or pulling power characteristics of the diesel make it well suited for heavy work and sustained operation. The fuel does not readily evaporate. The greater miles per gallon of the fuel oils more than doubles the cruising radius of the truck or tractor without refueling in comparison with the gasoline engine. The diesel is comparable in weight to gasoline engines of equal piston displacement. However, with less fuel oil required for any given mileage range, the combined weight of engine and fuel is in favor of the diesel.

In the diesel engine, which has no carburetor, pure air is drawn into the cylinder combustion chamber on the intake stroke. This air is then compressed to a pressure of from 350 to 500 lb. per sq.in. on the compression stroke. Then, at about top center, the low-grade fuel is sprayed into the compressed air, whereupon it ignites automatically and furnishes the power impulse.

The above procedure is accomplished by several different methods according to the design of the engine. In the Cummins diesel it is done by means of a single plunger which accurately measures and delivers, during the intake stroke, a charge of oil to each cylinder injector in turn by means of a distributor.

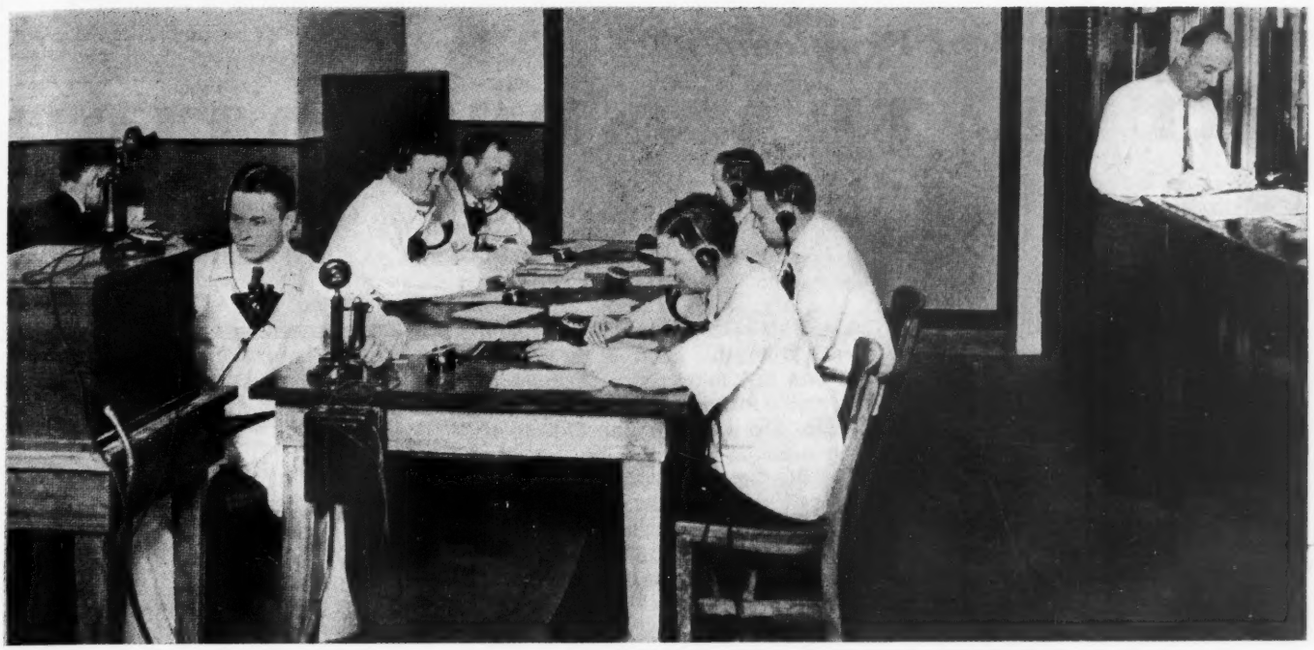
The fuel measuring pump and distributor are placed along one side of the engine frame and are driven from gears at the front of the engine. The same shaft drives the twin compressors supplying air to the tractor and trailer brakes.

On the other side of the engine are the air filter on the intake header; the fuel strainer; the charging generator and the starting motor. The latter starts the diesel by current from a 24-volt storage battery carried on one of the running boards.

Motor truck maintenance men accustomed to the even running of high-speed gasoline engines have remarked at the vibration of four-cylinder diesels at slow speeds. This condition has been improved greatly by better engine mountings and by the use of six instead of four-cylinder engines.

While the spark plugs and other units of the electrical ignition system of the gasoline engine have been eliminated, they have been replaced in the diesel by such accessories as the measuring pump, the distributor and the fuel-valve body and injecting plunger in each cylinder head. As the use of the automotive diesel increases, it will result in the development of a new maintenance technique which will progressively reduce the cost of running maintenance and repair work.

One cent a mile for fuel is the record of the above diesel-engined Sterling tractor-trailer combination in its first 35,000 miles of service for C. J. Fayen, New York City milk hauler. The tractor is equipped with a six-cylinder Cummins diesel burning No. 3 furnace oil at an average of 7 miles to the gallon. Carrying cases of milk, the unit makes three trips a week on a 480-mile round-trip run between West Pawlet, Vt., and New York City.



More than 1,200 phone calls per night will go out from this six-place call table at Southern Dairies Co., Washington, D. C.

How The Call-Order System Works

In the Distribution of Ice Cream

IN THE DAYS of ice-and-salt refrigerated truck bodies it did not improve the quality of ice cream to haul it all day over a long route and back to the hardening room of the plant in case it was not sold by the route salesman operating a peddle truck. This adverse circumstance led to the development of the system known variously as the call-order, call-up, or call system of selling.

In theory it is based on the idea that local telephone calls are cheaper than the cost and injury to quality of ice cream occasioned by hauling unsold stock all day, or by missing sales by running out of certain flavors. It sounds like a very simple and straight-forward application of common sense to telephone the customer, ascertain his wants and then deliver the goods.

However, to make telephone calls on a mass production basis requires special equipment and well-ordered routine. One who is engaged in telephoning for many consecutive hours needs head phones and a chest transmitter in order to avoid arm fatigue. And both hands must be free for switching, dialing and handling papers.

In most call-order rooms a long table is equipped on both sides with operating units at 48-in. intervals each consisting of a half dozen switch-listening keys connected to as many trunk lines, a plug-in for the head phones and transmitter, and a firmly mounted dialing mechanism. In front of each salesman is a list of all the stops on a given route, the prearranged hour at which to call, their correct addresses, telephone numbers and blanks on which to record the orders.

When the boys are going strong they can average between 200 and 250 local calls each per 8-hour shift: express and suburban calling is slower. But they have to be good to make that speed.

Here is how it works in a big city where everybody knows what to expect. A fast worker dials numbers successively on his several trunk lines until somebody answers. Anywhere from one to three phones in faraway stores may be ringing at once. When the first signal light flashes the salesman throws the switch key on that line and announces the name by which the ice cream company is familiarly known such as "Polar" or "White Star," which either brings the immediate order or sends somebody at the other end scurrying to the ice cream cabinets to find out what is needed for the next day.

In the meantime the other customers answer back and the procedure is repeated. By proper manipulation of the listening keys the calls are "held" but not crossed. In theory, at least, the first store called will be ready to give his order about the time the last of the group has answered back but, of course, if two come back at once, somebody has to wait. The orders are written up and the cycle of routine starts all over again. A most important feature is the matter of prearranging a satisfactory hour for calling up the customer.

Most call-ordering is done in the evening hours, efficiently, quickly and impersonally. One cannot take time for pleasantries when there are 200 or more phone calls in the daily stint. How the ice cream companies comment on the system is told in the two following pages in this issue.

Practical Problems of

TRUCK TRANSPORTATION

Discussed by Executives in the Food Industries

Call Systems on Rural Routes

OUR experience has been as follows: The call system outweighs the peddle system of selling. Fewer trucks can be used if the call system is used instead of the peddle system. The cost of operating motor vehicles plus the overhead cost and salesmen's salaries exceeds the cost of ice cream shipped in paper containers refrigerated with dry ice. Of course, the retail merchants should not order their ice cream by long distance telephone, but should do so by telegraph or letter.

During the past few years we have been shipping 5-gal. cans of ice cream by rolling them in corrugated paper and refrigerating them with dry ice on the bottom and top of the cans and sealing the cans with kraft paper. This has materially reduced our express rates in comparison with the old way of shipping ice cream.

The questions that you have asked are based only on out-of-town accounts. I really believe that the peddle system in the city proper provides the best way of contacting the distributors and avoiding competitive manufacturers making inroads on our accounts.

If the manufacturers would stress more bulk, quart and pint packages instead of playing up the specialties, we would find that the industry would make a considerable increase in gallonage.—G. T. GUSTAFSON, *Biltmore Dairy Farms, Biltmore, N. C.*

Peddle System More Satisfactory

IN reference to the call system in our territory, would say that we probably spoiled our customers by having our driver salesmen on our routes trained to take care of their requirements from the point of keeping the fountain or cabinets stocked up, resulting in the customers being educated in having our driver salesmen look after their needs.

At the time of our experiment with the call system, all of the customers were called and they were either too busy or lazy to look and see what they needed. This resulted in their getting short of some special item and having to call us, the consequence of which was instead of making one delivery daily or every other day in any one particular section, we were making two or three special deliveries in the same territory.

At this time of the year all of the routes are covered by the peddling method every other day. This method has proved more practical, all of the customers are happy, resulting in very few if any special deliveries, which of course keeps our delivery cost at a minimum.—W. J. DESMOND, *manager, General Ice Cream Corporation, Hartford, Conn.*

Peddle System Most Advantageous

OUR experience with ice cream deliveries in the San Francisco area has been almost entirely with the peddle system. Our call system has been of small consequence in our total volume of deliveries. We only used the call system in some of the outlying territories where we were obliged to pay toll charges of from 10 to 20 cents for each call. We have recently changed this district over to the peddle system because the cost of operating a little heavier equipment is less than the amount of the toll calls each month.

I believe that fewer route trucks can be used where the call system is employed, particularly in the winter. This again might not be true because of our uniformity of climate in San Francisco, and consequently more uniform business than in most ice cream delivery areas. Our peaks are not as high in summer nor are our valleys as low in winter.

It was our experience with the call system which we used to a limited extent, that the customer oftentimes did not know exactly what his requirements would be for the following day if the weather might change for the better. Also, in many cases, when we made our first call, the ice cream dealer had not segregated his requirements for the next day and consequently had to call us back, which he often did not do. Therefore, we had to call him a second time. It was also our experience that the dollar sales to a customer were better in the case of the peddle system. The average dealer buys according to the weather, and if the morning shows up good he will buy heavier than if he had to place his order the night before.

One outstanding advantage which we feel the peddle system has is daily personal contact with a member of our route sales organization. We have a daily report system, our route men making out a report each evening on customers who have a suggestion or a criticism to make. In this way we are having a 100 per cent sales contact with all of our dealers every day. We deem this of special value in some areas where we have bootlegging activities to meet.

We have a daily check on any foreign products which may be entering our cabinets. We also have a systematic pick-up system by which we pick up, once each week, all ice cream that is older than the limit which we have set for our products to remain in the dealers' cabinets.

Our route salesmen also carry on a systematic cabinet cleaning scheme, taking a certain number of cabinets each day and removing therefrom ice and such other foreign material as may

To Our Automotive Readers:

REALIZING the many and varied problems of motorizing transportation which are constantly arising in the handling of all kinds of food products, the editor will be glad to receive suggestions as to what are the particularly pressing problems that readers would like to have discussed in these pages.

This Month's Question

QUESTION 5

Call vs. Peddle System of Ice Cream Delivery

1. Do the advantages of the call system outweigh those of the peddle system?

2. Can fewer route trucks be used on the call system for the gallonage delivered?

3. Is the cost of making calls less than the reduction of truck expenses?

have accumulated in the wells and under the covers. This we find to be very beneficial, from the standpoint of general cabinet appearance and electric current consumption economy for the retailer.

We have made extensive studies of the various call systems which are being used throughout the United States, and we are still sticking to the peddle system, particularly in view of the fact that we can now operate with trucks which can be very economically refrigerated, and which are considerably lighter than the trucks used in the old ice and salt days—H. J. SEBA, *manager, San Francisco Ice Cream Division, Golden State Co., Ltd., San Francisco, Calif.*

Favors the Call System

WE believe that the advantages of the call system outweigh those of the peddle system and that fewer route trucks can be used on the call system than on the peddle system.

The cost of making the telephone calls does not exceed the reduction in the cost of the truck system.—*Brown's Velvet Ice Cream Co., Mobile, Ala.*

Prefers the Peddle System

WE use the call system only in a very limited way in the west. Undoubtedly fewer route trucks can be used where the call system is maintained and proper supervision is maintained on special deliveries.

As far as I know, there is no one using the call system out here, as it is used in the east. In winter we all have accounts that are either small or are in outlying districts, to which we give intermittent service, on call.—G. A. TURNBOW, *president, Protected Milk Products Co., San Jose, Calif.*

Call System Saves Money

THE advantages of the call system outweigh those of the peddle system in the larger cities.

A smaller number of route trucks can be used on the call system for the gallonage delivered where the dealers are supplied with electrically refrigerated cabinets. If other types of cabinets are used such as "slug" cabinets or dry ice cabinets, then a definite number of trucks must be used at all times in order to carry refrigeration to these cabinets, whether or not ice cream is purchased.

Obviously, a route truck only delivers to dealers ordering ice cream when electrically refrigerated cabinets are used. Hence, the number of trucks used can be determined each day by the number of gallons to be delivered. Even in the summer months when there are days of inclement weather, or when for some other reason, the business decreases overnight and the traffic manager can reduce the number of trucks to meet the requirements of the day.

The cost of making the calls is less than the reduction in truck expense.

In some of the smaller cities, where we will say that it would require ordinarily two trucks to serve the market because of distance covered, there is no advantage in using the call system, because the number of trucks cannot be reduced. These would ordinarily be two-truck markets in the summer and one-truck markets in the winter.

With reference to "slug" cabinets—that is a type of cabinet that is refrigerated with a sealed can of brine that congeals under low temperatures. These brine cans are frozen solid in the plant, then carried by the route truck to the dealer's store and placed in his cabinet. The usual practice is to replace some of the slugs in a cabinet every day. A four-hole cabinet is supplied with 16 slugs.

Some manufacturers have found that the call system does not reduce truck expense sufficiently to make a distinct saving because many dealers would refuse to order the night before and then call for a special delivery the next day. In that event, special delivery costs run higher with the call system than without it. However, this is a sales problem, and if the dealer is properly sold on the advantage of the call system, particularly with reference to getting fresh ice cream every day and having his order exactly as he wants it, then there should be no trouble.

Obviously, with the call system, only orders that are filed are sent out on the route truck and there are no returns. With the peddle system, returns run as high as 25 per cent and the fluctuating temperature in the truck body on a hot day harms the quality of the product.

Another disadvantage found by some manufacturers is that where a driver does not appear every day to attempt to sell the dealer an order, a competitor with an aggressive driver-salesman will succeed in selling some of his merchandise to the dealer, which results in what we know as a split stop. This, again, is a sales problem and can be overcome with a vigorous sales policy.

Finally, our own opinion is that the call system is profitable to us from a quality standpoint as well as an economic standpoint in large centers of distribution. We do not use it in the smaller cities in the South, where no advantage would result from a reduction in truck expense.—E. J. MATHER, *president, Southern Dairies, Inc., Washington, D. C.*

Lose Contact With Call System

WE have used the call system here at the Columbus plant and have just recently discontinued it. We did think for a while that the call system saved some money, but as time went on, its effectiveness seemed to be lost. With the call system, you lose the contact between the route salesman and the customer. We have always considered the men on our wholesale delivery trucks as salesmen and we are attempting to increase their effectiveness as salesmen—which is one of the reasons we have started to use the peddle system again.

The call system works somewhat better in summer than in winter. In winter many of our smaller dealers allow their supply to become low and in some instances we have found dealers with only vanilla ice cream and bars. The customer coming into the store and asking for a flavor of ice cream probably would take vanilla, if the flavors were not available, but he would not be inclined to stop in that store the next time he wanted ice cream.

As time went on the call system increased our special deliveries and also our shipping floor expense; since we do not have so many special deliveries to wholesale customers,we are able to give better service to our retail deliveries.—I. O. KOCH, *Borden's Dairy & Ice Cream Co., Columbus, Ohio.*

BOOKS RECEIVED

LABORATORY EXAMINATION OF WINES AND OTHER FERMENTED FRUIT PRODUCTS. By W. V. Cruess, M. A. Joslyn and L. G. Saywell, University of California. Published by the Avi Publishing Co., Inc., 31 Union Square, New York, N. Y. 111 pp., 7⅝x5¼ in.; cloth; illustrated. Price, $2.25.

Contents of this manual are more for the plant-control chemist than for one doing inspection work. It is thought that wines and similar fruit products can be better handled if their chemical composition and their microbiological content are known to those working with them. This book should be considered for what it is: a manual of laboratory procedure for the man in the winery studying fermented fruit juices and extracts.

THE FOUNDATIONS OF NUTRITION. Revised Edition. By Mary Swartz Rose, Professor of Nutrition, Columbia University. Published by the Macmillan Co., 60 Fifth Ave., New York, N. Y., 1933. 630 pp., 5⅝x8 in.; cloth; illustrated. Price, $3.

Fundamental principles of human nutrition are discussed in terms that are understandable to the lay reader. Essential factors in an adequate diet are discussed in detail. Foods containing these essentials are indicated and a new, practical method of comparing nutritive values of common food ma-

terials is described. Reading references are listed at the end of each chapter.

THE ECONOMICS OF RECOVERY. By Leonard P. Ayres, Cleveland, Ohio. Published by the Macmillan Co., 60 Fifth Ave., New York, N. Y., 1933. 189 pp., 5¼x7¾ in.; cloth; illustrated. Price, $1.75.

By reviewing origin and progress of the breakdown in business, both domestic and foreign, the author diagnoses the depression. An analysis of measures and legislation sponsored to meet the emergency is made and requisites for recovery are suggested.

CHEMICAL ENGINEERS' HANDBOOK. By John H. Perry, editor-in-chief, and a staff of 52 engineers and scientists. McGraw-Hill Book Co., New York, N. Y., 1934. 2609 pp., 5x7 in.; flexible fabrikoid binding; illustrated. Price, $9.

Production men, engineers and chemists employed in the food industries will find this handbook fully as useful as do chemical engineers. It treats of topics, such as heating, drying, refrigeration, distillation, mixing, grinding and evaporation, which are basic to food processing. The first work of its kind, and available for only a few months, it has already won acceptance as a standard reference handbook.

FOOD AND HEALTH. By H. C. Sherman, Mitchill Professor of Chemistry, Columbia University. Published by Macmillan Co., 60 Fifth Ave., New York, N. Y. 1934. 296 pp., 5⅝x8 in.; cloth; illustrated. Price $2.50.

Summarizing the sanitary, the economic, and the nutritional aspects of food the author reviews the latest knowledge of the relation of food to health. He has made use of the best information obtained through intensive and extensive study and investigation. It is a book that all food manufacturers can read with profit.

FOOD BUYING TODAY. By Alexander Todoroff. Published by Grocery Trade Publishing House, 755 N. Central Ave., Chicago, Ill. 1934. 96 pp., 6¼x9¼ in.; cloth; illustrated. Price $1.00.

Although intended as a guide for the buyer of food for consumer use, this question and answer compilation contains a surprising amount of information about the different types and forms of vegetables, fruits, and meats which a food manufacturer might use as ingredients or raw materials.

TIME TO LIVE. By Gove Hambidge. Published by Whittlesey House, McGraw-Hill Book Co. Inc., 330 West 42nd St., New York, N. Y., 1933. 144 pp. 4¾ x 7¼ in.; cloth. Price, $1.50.

In these days of discussion and proposed legislation for a shorter working day and more leisure time one can read with pleasuse this account of adventures in the use of leisure time.

AMERICA SELF-CONTAINED. By Samuel Crowther. Published by Doubleday, Doran & Co. Inc., Garden City, N. Y., 1933. 340 pp., 5¾x8¼ in.; cloth. Price $2.00.

To food manufacturers as a group the contents of this book is of interest only in that it presents argument for and justification of economic nationalism. Many of our readers would find their business seriously crippled if economic isolation prevailed.

WHAT'S ON YOUR MIND

To the Editor of FOOD INDUSTRIES:

In the October, 1934, issue of FOOD INDUSTRIES, page 467, appears a practical suggestion submitted by a Mr. H. G. Plenum, Mobile, Ala., headed, "Telltale Protects Pure Water."

In reference to this article may I direct your attention to several sections of an ordinance of the City of Baltimore and the Rules and Regulations of the Commissioner of Health of this city, governing plumbing and drainage work, outlined as follows:

"No physical connection shall be permitted between a potable water supply and an industrial, fire, or other auxiliary or emergency supply. This prohibition applies to all piping systems, either inside or outside of any building or buildings. There shall not be permitted any direct connection between a well or pure water reservoir or a potable supply and any sanitary sewer or storm water drain, for the purpose of carrying away the overflow of said well or reservoir." Sec. 12, p. 23.

"Cross Connections Prohibited. No plumbing fixture, device or construction shall hereafter be installed which will provide a cross section between a distributing system of water for drinking and domestic purposes and a drainage system, soil or water pipe so as to permit or make possible the back flow of sewage or waste into the water supply system." **Regulation No. 15.** p. 32.

"Cross Connection Prohibited. No water service pipe or supply pipe connected with the public mains shall be cross-connected in any maner to or with any pipe supplied with water from a well, cistern, river or any other source than the public mains." **Regulation No. 133. p. 83.**

These regulations specifically prohibit such cross connections from being installed in this city. I am sure that other cities in the country also have similar restrictions to the installation of such cross connections.

No doubt you are familiar with the report of the investigation of the recent amoebic dysentery outbreak which occurred in Chicago during the late summer of 1933, which was reported as being caused by infection of the water supplies of two of the hotels in that city with sewage. The incidents surrounding a number of cases of amoebic dysentery which occurred among the personnel of a food manufacturing establishment in that city also pointed to a cross connection as being the direct cause of that outbreak.

I suggest therefore, that in the future all practical suggestions submitted by contributors to your magazine be carefully reviewed by a sanitary engineer or one who is familiar with the public health aspects of food manufacture, processing and distribution before the practical suggestion or other item is published.

Please consider this suggestion not as criticism of your magazine, but one motivated in the interest of protecting FOOD INDUSTRIES from criticism.

FERD. A. KORFF
Director, Bureau of Food Control
Health Department
Baltimore, Md.

To the Editor of FOOD INDUSTRIES:

Frankly I don't know about the wisdom of the pig-slaughtering campaign of the AAA, but I am quite certain that in the corn-hog program I have personally paid in reduced hog prices far more processsing tax than I shall ever receive from the government. I think nothing could have hurt the hog market more, because people hate to pay taxes when they know they are doing it, and there are too many substitutes for pork to compel the payment of the processing tax. The amount of this tax was taken off the price of our marketable pork as fast as it was put on by the government.

The relation of wheat price to processing tax has not been so clearly in evidence as in hogs, but I would not be surprised but that it is still there, although it is not so easy to get wheat substitutes as pork substitutes. I have not the slightest doubt but that subsidy has been a godsend to all districts where wheat has failed the past two years, but that does not justify the practice as a matter of principle. The fundamentals are the same as they were for the discredited Farm Board, although the administration and the psychology used by the AAA were infinitely wiser. Then, too, the weather has been with and not against the plan.

I think you can gather that I am not an enthusiast for the AAA, although I cannot hold it all against the administration, which simply gave us what the farm leaders said we wanted. I went to Selma last summer to hear Secretary Wallace, and I confess he is a scholar and a gentleman, even though I cannot agree with his program. I do not doubt his sincerity or his determination to better the condition of the farmer.

I consider the present cattle-buying program in drought areas to be rightly in the province of government, and also consider the needs of stricken wheat farmers must be met. But wheat subsidies tend to help those most who need it least. For instance we, in Reno County, need it little, while others need it far more. I am forced, however, to the same conclusions, that there are many others lost in the mazes of the present. At least the government tried to do something.

N. L. ANDERSON
Partridge, Kan.

IDEAS . . . FROM PRACTICAL MEN

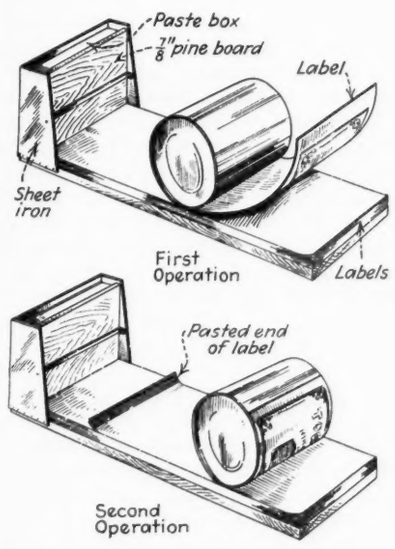
Labeling Device

IN THE COURSE of 25 years experience in the canning industry, I have often been confronted with the necessity of labeling small batches of cans, too small to warrant a set-up on a labeling machine. As a result, I developed the labeling device described here, which is also a time and money saver for plants too small to have a labeling machine, and can be used for placing labels on packages and printed matter.

Referring to the accompanying sketches, the base of the device is of $\frac{7}{8}$ in. pine board, made to fit the size of label being used. To one end of this board is fastened a U-shaped sheet iron support for the paste box. This is 4 in. high, and extends 3 in. along the sides at the bottom and $1\frac{1}{2}$ in. at the top. Across the open end of this support is welded a strip of $\frac{3}{4}$ in. flat iron, to hold the paste box in place.

The paste box has no top or bottom. Three sides are made of a piece of sheet iron, bent to shape. The front is made of $\frac{7}{8}$ in. pine board, extending at the top about an inch above the sheet iron.

In use, the labels are placed on the bottom board, plain end out, lap end under paste box support, printed side down, a number of labels being placed in this position at the same time. The paste box is then slipped into its support, and filled with paste of a rather thick consistency, stiff enough so that it does not run out of the box readily, but merely sags down onto the uppermost label.



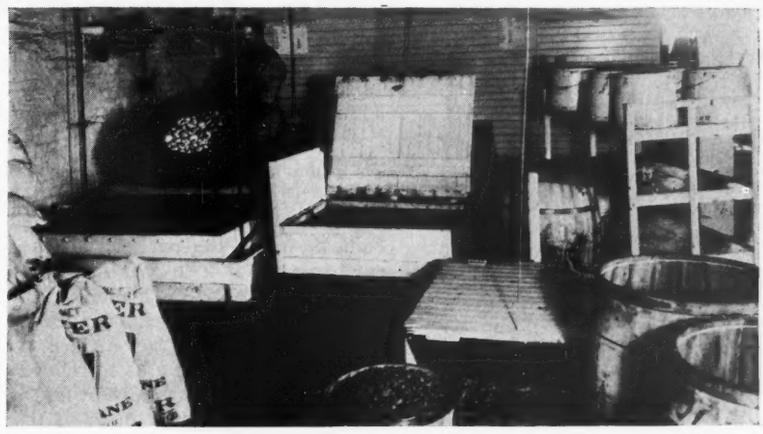
Referring again to the sketches, the can is placed as in the sketch marked "first operation." The end of the label is then picked up with the right thumb placing the label up over the can, getting it even, as in "second operation." Next the first three fingers of the left hand are placed on this end of the label. While these fingers hold the label tightly on the can, the can is pulled toward the operator until the pasted end of label comes out from under the paste box.

This puts the can and label in the position shown in the sketch marked "second operation." The can is then rolled over, holding the label in place, until the can is rolled down over the pasted end of the label. Then can and label are lifted up in the left hand, bringing the right hand up over the lap, pressing it down. This completes the operation.

Labeling is continued in this manner until all but one of the pile of labels is used up. Then the last label and the paste box are lifted up and more labels are placed on the board. As many as 250 or 300 labels can be placed on the board at one time to advantage, although the device works well with less if that is desired.

The capacity of this device, of course, depends largely upon the skill of the operator and the nature of the work being done. In working it out, I have labeled as many as 500 cans of 5 oz. size in an hour. I have found that this device makes possible a saving of about 1 cent per dozen over other hand labeling methods.

L. W. HINKLEY, *Somerville, Mass.*



Batch Signal System

WHERE various ingredients are prepared on one of the upper stories of a plant for delivery to batch mixers or other equipment on lower floors, it is sometimes difficult for the machine operator to give warning when he is about to need another batch.

Where chutes are used for making delivery, one mince meat manufacturer has developed a useful method of signaling. Chute openings on the preparing and storage floors are provided with hinged lids. By means of a cable and pulley arrangement these lids can be opened or closed from the operating floor below—counterweights holding them in the desired position.

At a predetermined time before a new batch is required, the machine operator pulls the lid cable, opening the lid on the floor above. When the worker on this floor has delivered a batch through the chute to the hopper below, he closes the lid, and the position of the counterweight then shows that a new batch is in the hopper.

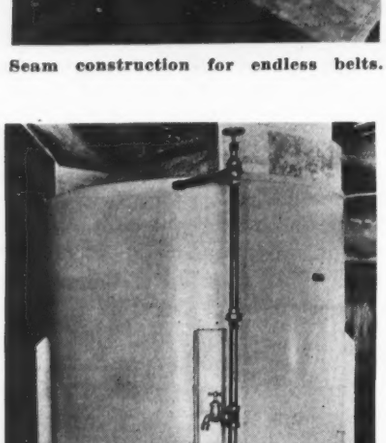
Send In Your IDEAS

COOPERATION is the keynote of the day, and you can help yourself and others by using this page for exchanging helpful information about how things are done in the plant. For every idea printed, FOOD INDUSTRIES will pay $3 or more.

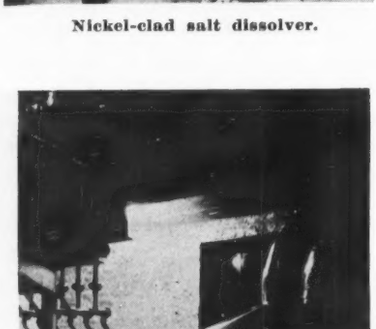
NEW EQUIPMENT

for Food Manufacturers

Seam construction for endless belts.



Nickel-clad salt dissolver.



Brew kettle constructed of Alleghany metal.

Endless Belts

By a new method of construction, known as the "Plylock" belt joint, B. F. Goodrich Co., Akron, Ohio, is making endless belts in which the tendency of the outside seams to open up during severe service is said to be avoided. In this construction, the seam is embedded, or countersunk, below the surface of the belt in such a position as to relieve it of strain and shield it from wear and windage. This is possible through the use of a thick cushion of rubber reinforced with bias fabric and permanently vulcanized in position. Two years of industrial tests have shown such good results that all endless belts made by this company now employ this feature.

Corrosion-Free Salt Dissolver

For preparing brine solutions for use by meat packing plants and for similar purposes, a new type of rock salt dissolving equipment constructed of nickel-clad steel is claimed to give freedom from contamination. The illustration shows one of these dissolvers, made for the International Salt Co., Scranton, Pa., who lease them to their customers for rock salt. This unit is 4 ft. in diameter and has a capacity of 200 gal. of pure, saturated brine per hour.

The nickel-clad steel used in constructing this equipment is a joint development of International Nickel Co. and Lukens Steel Co., the latter company producing the metal in their mills at Coatesville, Pa. The material is a hot-rolled, bi-metal sheet, composed of a thin layer of pure nickel backed with a heavy sheet of ordinary steel. In the rock salt dissolver, only the pure nickel comes into contact with the brine, thus avoiding corrosion and consequent contamination of the product.

Stainless Steel Brew Kettle

What is said to be the first stainless steel brew kettle in the United States was recently constructed by the Cream City Boiler Co., Milwaukee, Wis., and installed at the Weber-Waukesha Brewing Co. This kettle is made of ten gage Alleghany metal and is polished inside and out. The construction is welded. Magnesia block insulation and stainless steel fittings are used. The heating element is a three-ring, low-pressure, stainless steel coil. A stainless steel hop strainer is used. Cleanliness, freedom from contamination, and strength combined with low weight are claimed for this type of kettle.

Compensated Humidity Control

Accurate maintenance of any desired differential between the indoors relative humidity and the outdoors temperature is accomplished by a compensated humidity control developed by Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. With this device the variable factors in building construction, such as insulation, are compensated for, and the relative humidity can be maintained at the highest point possible without condensation of the moisture in the air occurring. This result is accomplished by using two instruments operating in conjunction. A modulating, or potentiometer, type of humidity controller operates in the normal fashion, supplying the desired relative humidity in accordance with the setting of the controller. These normal functions are performed until the outside temperature begins to drop, then a remote bulb temperature controller, the bulb of which is outdoors, through its electrical connection with the humidity controller, acts as a limit control. As the outside temperature drops, the temperature controller effects the operation of the humidity controller, causing it to supply less moisture in a predetermined amount that will prevent all possibility of condensation on window and walls.

Aluminum Paint

Better spreading is claimed for an aluminum paint developed by Aluminum Industries, Inc., Cincinnati, Ohio. This spreading quality, which is said to give more thorough coverage and better protection, is obtained through use of a high vacuum. Aluminum powder, which is mixed with paint to make aluminum paint, tends to lump during mixing, just as flour does when mixed with water. In each of these lumps some air is imprisoned. By applying a high vacuum to the mix, the lumps are exploded, the air released, and the powder can be uniformly distributed throughout the paint.

Waterproof Motor

Splash-proof, drip-proof and weatherproof motors for use indoors and outdoors have been added to the line of Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. This is a wholly new de-

sign, with thick cast-iron frame and case, resistant to corrosion by water or chemicals. A baffle plate cast integral with the inner side of the motor bracket prevents splashing liquids from reaching the windings. This motor is of the induction type, either squirrel-cage or wound-rotor design, of 50 deg. continuous rating, and is furnished with either ball or sealed-sleeve bearings.

Irradiator for Milk

RECENTLY developed by the Hanovia Chemical & Manufacturing Co., Newark, N. J., with the assistance of the National Dairy Products Co., and the Wisconsin Alumni Research Foundation, the Hanovia-National Milk Irradiator is now available for the irradiation of market milk. It consists of two chambers, the starting and operating chambers. The ultraviolet ray generator, mounted on roller carriage, can be passed from one chamber to the other. This generator is brought to required intensity in the starting chamber and moved into the operating chamber to a point opposite the flowing film of milk.

Milk flow is automatically maintained at 1,250 lb. per hour. Flow is over a smooth horizontal edge which maintains a uniform film over the inclined exposure surfaces. The milk flows from this surface into collecting troughs and then is discharged to the pasteurizer through suitable piping, a storage tank being interposed if needed.

Exposure is from two to three seconds, long enough to produce the necessary irradiation, but too short to produce off-flavors.

In the operating chamber, the generator is positioned at the center, between the two films. Reflectors are so placed as to concentrate the rays evenly on the milk. Generator is of the mercury arc type, in a quartz tube. It has a guaranteed life of 2,000 hours.

Control is by means of a photronic cell and relays and a recording meter is supplied which indicates and records the intensity of the radiation. A flow control is also supplied, which shuts off the generator immediately the milk flow ceases. These controls are interlocked so that the flow and radiation intensity are maintained at the correct levels.

The device occupies a space of 6x3 ft. and is 6 ft. high. It is made of aluminum, with Inconel parts in contact with the milk.

Electric Flowmeter

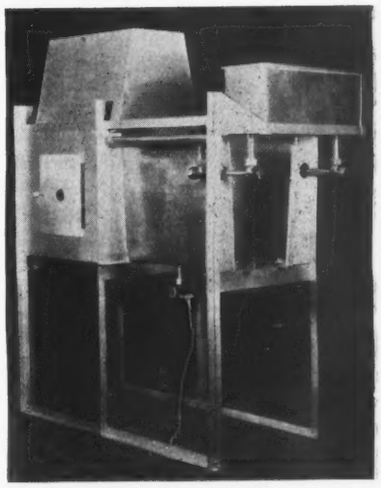
POWER for operating the pointer, pen and integrator, that is the same throughout the entire range of measurement, is the feature of a flowmeter recently developed by Cochrane Corp., Philadelphia, Pa. This power is supplied from an external motor, which replaces the pressure differential over the orifice, used by most such meters to move the mechanism.

Flow through the pipe line causes a float carrying a soft iron armature and resting on the mercury in a U-tube, to be displaced a certain distance. This displacement is balanced electrically by the shifting of a similar armature in the recorder, the two armatures being surrounded by the inductance coils of a bridge circuit traversed by an alternating current. Unbalance of the circuit deflects the boom of a sensitive galvanometer, which directs the application of power to shift the recorded armature until the galvanometer returns to neutral.

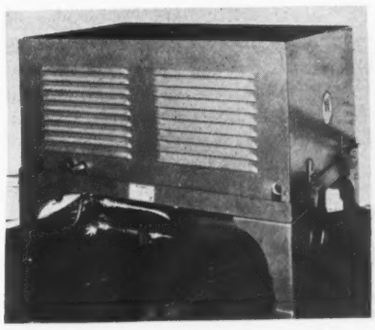
As no current flows through the galvanometer circuit at the moment of measurement, accuracy is not influenced by variations in the electrical resistance of conductors, by variations in contact resistance, by changes in length of leads, by inequalities in winding, or by strength of magnetic field. The consumption of current is not more than 25 watts. This method of operation is called the null, or zero-balance method, and is the same as is used in precise measurements of electrical potential.

Refrigeration Units

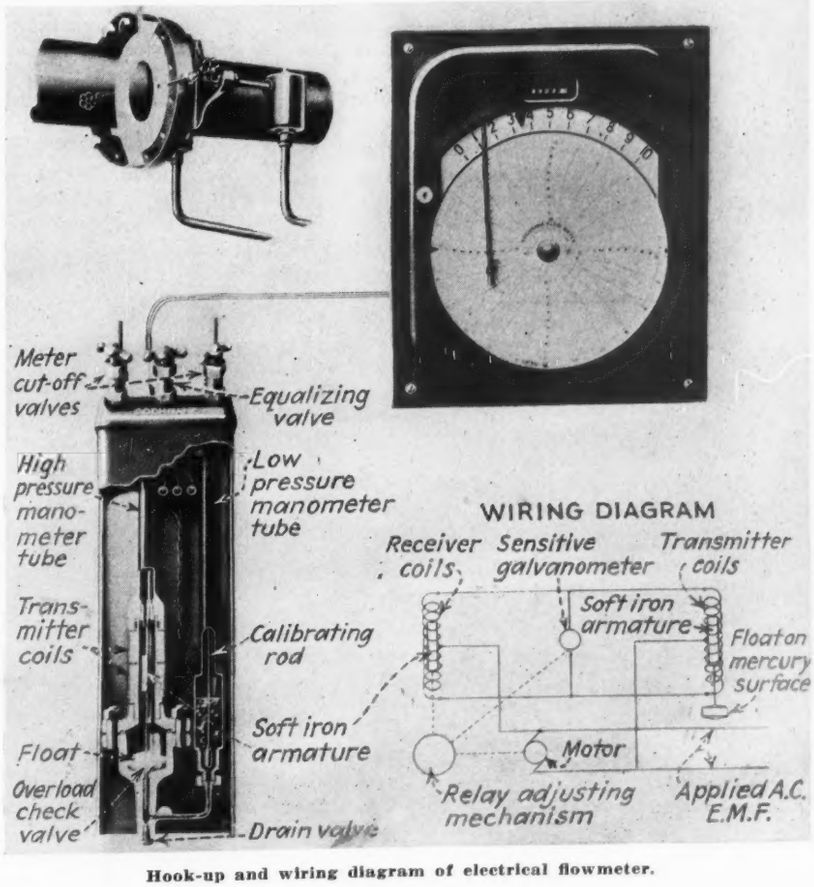
SEVERAL additions have recently been made to its line of commercial refrigeration units by Westinghouse Electric &



Hanovia-National milk irradiator



Condensing refrigerating unit.

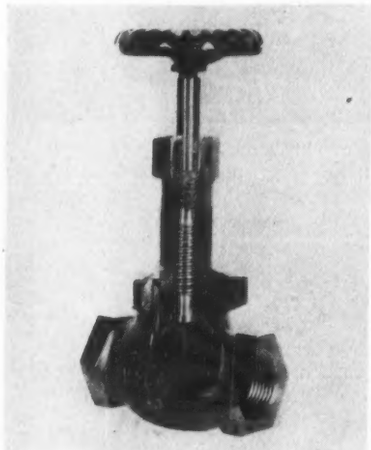


Hook-up and wiring diagram of electrical flowmeter.

Mfg. Co., East Pittsburgh, Pa. These include four compressor units: 1-hp., water-cooled; 1-hp. air-cooled; 1½-hp., water-cooled; and 1½-hp. air-cooled. In these models the compressors are vertical, two-cylinder, single-acting, cast in a block with the crankcase and oil pump. Reed-type valves are used, both intake and discharge mounted in head, avoiding leakage of refrigerant into crankcase. These condensing units have all non-flared joints silver-soldered. Two larger units are of the open-type, condensing design. These are 2 and 3 hp.; and feature oil pump, oil separator, reed-type valves in head, directed flow of air over compressor, and high speed to improve balance and cut down vibration. The two-cylinder compressors are equipped with glass windows on each side of the crankcase for visual inspection of the oil level.

Globe and Angle Valves

RENEWABLE bronze globe and angle valves of improved design are now being marketed by Fairbanks Co., 393 Lafayette St., New York, N. Y. Among the new features claimed for these valves is the radial seat between body and bonnet, said to insure a tight seat and correct alignment of parts, and to reduce wear. The disk ring, of special composition, is carried in a disk holder of standard dimensions, so that other standard makes of disk ring can be used if desired. All parts of these valves are interchangeable.



Bronze globe valve.

Industrial Gasoline Tractor

AN ALL-PURPOSE industrial gasoline tractor, in three models, is announced by Clark Tructractor Co., Battle Creek, Mich. These models, called the "Clarktor-6," have 46 hp., six-cylinder motors that are said to give 1 lb. of drawbar pull for every pound of tractor weight. The transmission provides a wide range of speeds, up to 18 m.p.h. All models have self-starter, generator, battery, electric horn, front bumper plate, eye coupler, pneumatic tires. Lights are available on all models for night operation. Extra equipment includes dual tires or solid tires, special couplers, condensing muffler, speedometer, and front fenders. The models available are a light model for general use, a speed model, and a heavy model for such work as spotting freight cars.

Floor Repair Material

A COLD mastic compound for repairing broken out places in plant floors, called "Amolastic," is being marketed by American Oil & Disinfectant Co., 129 East 26th St., New York, N. Y. The amount of aggregate mixed with this material determines the hardness to which it will set up. For foot traffic, a soft floor may be obtained, while for heavy traffic the surface may be made smooth, non-skid and durable, depending on the type and quantity of aggregate. It is claimed that the material will bond to all types of floor.

Gasoline industrial truck.

The Manufacturers Offer...

Cream Separator—An "air-tight" cream separator, for producing smooth, high viscosity, air-free cream, and foamless skim milk, is described by De Laval Separator Co., 165 Broadway, New York, N. Y., in a new pamphlet.

Laboratory Homogenizer—For all types of experimental and research work, a laboratory-size homogenizer is described by Manton-Gaulin Manufacturing Co., Inc., 7 Charlton St., Everett, Mass., in Bulletin No. 33.

All-Metal Churn—The Challenge Churn, constructed completely of metal, designed by C. L. Mitchel, of Challenge Cream and Butter Association and manufactured by Jensen Creamery Machinery Co., Bloomfield, N. J., is described in an illustrated bulletin.

Industrial Instruments—For indicating, recording and controlling, made by Bristol Co., Waterbury, Conn., described in general bulletin No. 420.

Delivery Trucks — Thorne gas-electric trucks, Model B-3, complete drop frame and Model S-2, straight frame chassis, described by Gas-Electric Motors, Inc., Cleveland, Ohio, in a new folder.

Ice Cream Freezer—40-qt., direct-expansion ammonia, ice cream freezer, Type E-34, described in a new pamphlet issued by York Ice Machinery Corp., York, Pa.

Deep Well Pumps—For industrial service, of water-lubricated turbine type. Specifications, list of parts, and partial application list given by Deming Co., Salem, Ohio, in an illustrated catalog.

Bottle Saver—For assuring the return of empty store milk bottles, this receptacle, made by Bottle Savers, Inc., Buffalo, N. Y., returns a stick of gum or a piece of candy for each bottle inserted. Described in illustrated folder.

Oil-Fired Boiler—Specifications, description and installation pictures of the "Oilbilt" steam generator given by Cleaver-Brooks Co., Milwaukee, Wis., in a 12-page bulletin and a new folder.

Ice Cream Cones—Of pyramid shape, together with method of molding cream for use with these cones, discussed in a folder by Pyramid Sales, Inc., Toledo, Ohio.

Dairy Equipment—Brief mention of its line of dairy equipment in a folder issued by Mojonnier Bros. Co., 4601 West Ohio St., Chicago, Ill., which stresses a new compact cooler.

Milk Equipment—Various publications of E. A. Kaestner Co., 516 North Calvert St., Baltimore, Md., as follows: pamphlet on Research and Irradiation Equipment Corp. high-potency irradiator; Bulletin No. 153, utility pasteurizer; Bulletin No. 154, high-temperature, short-time pasteurizer; Bulletin No. 155, surface coolers; pamphlet on new foam destroyer; pamphlet on Type B vat pasteurizer; pamphlet on internal tube heater.

Truck Temperature Control—For controlling the temperature in refrigerated truck bodies, the "Statotherm" control is the subject of a bulletin published by Mack Trucks, Inc., 25 Broadway, New York, N. Y.

Things Are Happening . . .

- *NRA revamps codes; milk, basic pacts delayed*
- *Reciprocity treaties under way; foods affected*
- *Tri-state canners fail to denounce ABC labels*
- *Pointers on beef storage given at ASRE meeting*
- *Butter men ask that cream grades be legislated*

Basic Code Awaits Takers; Milk Code Awaits Decision; Others Acted Upon

Only eight food industries had applied for operation under the basic food manufacturing code at the close of December, and the much heralded master pact remained on the shelf. All was not quiet on the food code front, however, for Division 6 of NRA was busily engaged in trying to figure out what to do about the labor code for the fluid milk industry and in smoothing out ruffles in codes now in operation.

Deputy Administrator George Carlson and the NRA Labor Advisory Board have been studying transcripts of the hearing held last month on the fluid milk code in an attempt to figure out if the dairy industry should be given a code whether it wants it or not; that it does not want one was very much in evidence at the hearing. The NRA never has slapped a code onto an industry, its practice being to talk the recalcitrants into one.

The canning industry code authority took under its wing on Dec. 10 operations of bulk kraut manufacturers, and the membership of the canning code authority probably will be increased to sixteen. Another canning code development is a ruling that, under the salmon canning pact, no member of the industry can sell canned salmon to another member except in accordance with a posted price.

Bakers' Council, in a move to give the semi-handicraft shops a better break under the code, has proposed to officially define this class and amend the code to allow them a maximum hour limitation of 44 a week, as compared with the 48 in effect for handicraft shops and the 40 for mechanical shops. This will be taken up at a hearing Jan. 8. Another hearing on this date will consider the applications of 48 firms under jurisdiction of the restaurant industry for exemption from the baking code. On Dec. 28 a hearing was held on the appeal of the restaurant industry from the NRA order denying it exemption from the baking code. The baking industry also is having trouble with "neighborhood" bakers, and the suggestion that 29,000 of these bakers secede from the code has been made by William Steinmetz, president of New York State Association of Manufacturing Retail Bakers.

The code authority for the candy manufacturing industry has made two interesting moves to solve code troubles. One is the contribution of a sum of money to the code authority of the wholesale confectionery industry in consideration of an agreement by that body to refrain from assessing candy manufacturers. The other move comprises a plan to establish a cost interchange bureau to furnish the industry with cost information needed in planning its future course. As an aid to obtaining compliance with the candy code, the code authority has adopted the policy of publicizing the names of those who have paid their assessments.

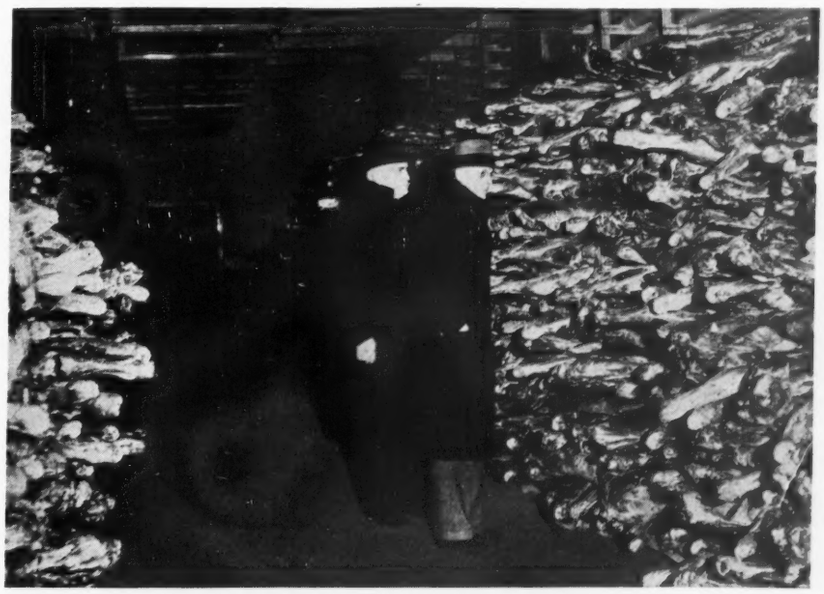
NIRB on Dec. 4 announced approval of macaroni code amendments which enlarge the definitions of macaroni products and which provide for the standardization of containers. Definitions of "standard," "No. 1" and "fancy" semolina and of "standard farina" and "farina" become effective in 30 days. Whenever the words "egg," "egg noodles" or "noodles" appear on the label, the product must contain at least 5.5 per cent of egg yolk solids. If no egg is used, the product is labeled "plain noodles."

An amendment to the ice cream cone code was approved Dec. 14, under which members of the industry may enter into an agreement providing for liquidated damages for code violation. The code authority for the spice grinding industry has proposed a definition of "deceptive container," giving a schedule of the amount of spice that may be packed in containers of certain sizes. One ounce of spices must not be packed in a container of more than 80 c.c. capacity. A separate code for the soybean industry is not necessary, testimony taken at a hearing shows, so the industry will abide by a code approved for some other industry.

A code for the New England sardine industry becomes effective Dec. 31; one for the Puerto Rican baking industry goes into effect Jan. 7.

To Change Code Charges

NRA is seeking a new formula for code assessments, and there is every indication that the order requiring a company to make payments only to the code authority under which it does the



NEGLECTED BUT NOT SPOILED

Senator Borah apparently started something when he criticized the administration of federal relief. He stirred up local investigations, and in New York it was revealed that considerable quantities of foodstuffs had been allowed to freeze in warehouses. The cameramen caught local relief officials inspecting part of the 14,000,000 lb. of veal stored in the Bronx terminal market to see if it had been damaged. It had not.

majority of its business will be repealed. The formula sought is one that will reduce confusion, simplify bookkeeping, provide more equitable distribution of assessments between code authorities and assure that every company pays full code assessments on the volume business done in any line.

Code Authorities Approved

NRA on Dec. 11 recognized appointees to the code authorities for the wheat-flour-milling and chewing-gum-manufacturing industries. The personnel is as follows:

Flour Milling Industry

J. B. Smith, Salina, Kan.; F. J. Allen, Winona, Minn.; Sydney Anderson, Minneapolis, Minn.; M. A. Briggs, Durham, N. C.; O. D. Fisher, Seattle, Wash.; George E. Hincke, Kansas City, Mo.; C. C. Hine, Los Angeles, Calif.; Fred Honea, Dallas, Texas; Richard P. Johnson, Knoxville, Tenn.; Julius E. Lentz, Laurys Station, Pa.; Fred J. Lingham, Lockport, N. Y.; R. Ward Magill, Wichita, Kansas; A. E. Mallon, Minneapolis, Minn.; C. D. McKenzie, Quincy, Mich.; Gaynor E. O'Brien, Greenville, O.; and Philip H. Postel, Mascoutah, Ill.

Chewing Gum Industry

Gilbert B. Mustin, Frank H. Fleer Corp., Philadelphia; Harry G. Wischmann, Wm. J. Wischmann, Inc., Brooklyn, N. Y.; Bert L. Atwater, Wm. Wrigley, Jr., Co., Chicago; Frank E. Barbour, Beech-Nut Packing Co., Canajoharie, N. Y.; L. E. Pritchard, American Chicle Co., Long Island City, N. Y.; and Ellsworth B. Buck, chairman, Code Authority.

Flavoring Products

Samuel W. Mutch, Whittle & Mutch Co., Philadelphia; W. F. Martin, J. Hungerford Smith Co., Rochester, N. Y.; Leon L. Benham, Richardson Sales Corp., Rochester, N. Y.; George M. Armor, McCormick & Co., Inc., Baltimore; and E. L. Brendlinger, The Dill Co., Norristown, Pa.

Code Violator Indicted

As another step in its drive to force compliance with codes of fair competition, the administration obtained on Dec. 20 a federal-court indictment against Anheuser-Busch, Inc., St. Louis. The government charges the brewing company with subsidizing dealers by furnishing "free" equipment and fixtures to seventeen retailers, a practice in violation of the brewers' code. The government is particularly determined to force compliance with the anti-subsidizing provisions of the brewing code, because it does not want brewers to get control over the "saloons" as they did before prohibition.

Two Food Bills Expected

With the strategy of the coming Congressional battle of the food bills beginning to take form, it appears that two measures will be introduced. Senator Royal S. Copeland will sponsor the measure which he fought for up to adjournment of the last Congress, and the Department of Agriculture will send up a bill closely following the lines of the Tugwell measure, which the Food and Drug Administration still insists is essential.

C. M. WALTERS

He has been made chairman of a committee formed to acquaint leading business men and others with the merits of the canners' side of the labeling question. Being connected with Libby, McNeill & Libby, Chicago, he is qualified to speak for the industry.

Industry is more sympathetic toward the Copeland measure, and this bill will have an advantage in that Copeland is almost sure to become chairman of the Senate commerce committee, which will have charge of the food and drug legislation.

Labor Legislation Likely; Strikes in Food Plants

It would appear that the segregation of section 7a of NIRA into separate labor legislation is in the offing. Outside labor interests are pressing the Administration for this, and there is strong sentiment among labor advocates in the Administration that such action be taken.

Meanwhile only a few labor difficulties have been reported in the food industries. Ward Baking Co., Baltimore, recently had trouble with International Union of Operating Engineers over the discharge of a sanitary engineer. The man is said to have been let out for incompetence, but National Labor Relations Board ruled that there was no real evidence showing incompetence and advised the company to reinstate the engineer.

J. E. Decker & Sons Packing Co., Mason City, Ia., suffered a strike recently when nearly 800 men in the slaughtering department refused to work with men not affiliated with Amalgamated Meat Cutters and Butchers Workers Union. And at the plant of Omaha Cold Storage Co., Sidney, Neb., 40 employees quit work in protest against wages paid for turkey picking. While getting the code rate of 5 cents a bird, they claimed they could not earn the minimum of 25 cents an hour because of inexperience.

Packers Look Into Sewers; Legislation Takes Shape

Meat packers in Chicago are not waiting for the Federal Government to tell them what's wrong with their sewage disposal systems. The major packers in the stock yards district have agreed to permit the sanitary board to conduct a sweeping investigation of sewage conditions prevailing in "packingtown."

Meanwhile, legislation giving the government control over industrial waste disposal in streams, lakes, rivers and coastal waters is taking shape. The new law is to be worked out by a committee headed by Secretary of War Dern, and is expected to call for the granting of authority with which to bring industrial plants and municipalities into line. As a means of fostering cooperation, the legislation is expected to provide for federal loans.

Handling of Relief Beef Seen Inefficient

As the number of cattle purchased for relief continues to grow, there comes out of the Southeast a report that the waste and cost involved in handling and processing the cattle have reached a high figure. In that territory, FERA rushed in to rehabilitate several defunct slaughtering plants, and for some weeks these have been running to capacity with inexperienced staffs and have been canning the weaker cattle. Canning facilities are far less than slaughtering capacity, and cold storage space is entirely inadequate. Losses of carcasses seem inevitable if the plan to kill quickly is held to.

What government handling of relief beef has cost it is impossible to ascertain. The only figures available are that to Dec. 13, 7,392,562 head of drought cattle had been purchased at the total cost of $100,367,508. Of the number purchased, FERA had processed 5,408,394 head and at that time had in transit or in pens 764,616 head.

Genealogy

IN ORDER to make it a matter of annual record, this statement is published every January.

FOOD INDUSTRIES was founded in 1928 by McGraw-Hill Publishing Co. Dr. H. C. Parmelee was its first editor. Dr. L. V. Burton succeeded him and is the present editor. Associated with him are: E. S. Stateler, associate editor; G. L. Montgomery, managing editor; F. K. Lawler and R. S. McBride, the latter in Washington, assistant editors.

Advertising Differential Questioned by Court

Suspicion has been cast upon the validity of the New York State milk law which establishes a price differential between advertised and non-advertised milk. The Supreme Court recently remanded to the federal district court for southern New York the case in which Borden Farm Products Co., Inc., challenges the constitutionality of the law. It was ruled that the lower court had erred in dismissing the complaint without considering the merits of the case.

Along the federal milk front, a skirmish has developed with Equity Union Creameries, Sioux City, Ia., which has been ordered to show cause why its milk license should not be restrained. The company is alleged to have sold milk below the minimum price. In its case against Hillcrest Dairy Co., Des Moines, Ia., the A.A.A. has decided not to appeal the order of a federal court denying the government's application for a preliminary injunction restraining the company from continuing in business after its license was revoked. The government will move to have this case set down for trial.

Adjustments in federal milk licenses continue, with amendments having been made in those for Chicago, Los Angeles, Boston, Battle Creek, Ann Arbor and Grand Rapids.

More Reciprocity in Foods

Reciprocal trade agreements are in the immediate offing with Brazil, Colombia and Haiti, and an agreement with Switzerland is under negotiation. The reciprocity arrangements with Colombia and Brazil are expected to favor coffee imports, while that with Switzerland may involve Swiss cheese. At the Tariff Commission's hearing last month, members of the dairy industry emphatically protested any reduction in the present tariff on Swiss cheese, citing that domestic Swiss production had increased from 15,000,000 lb. in 1916 to 40,000,000 lb. in 1933.

As Food Industries was going to press, it was announced that a reciprocity treaty would be negotiated with Finland, which imports lard, bacon, cereal foods and prunes from the United States.

To Fight State Wine Taxes

Wine is being taxed and regulated to such an extent in at least 26 states that the bootlegger is again flourishing. This is what Frederick J. Koster, past-president of California State Chamber of Commerce, recently told members of the California wine industry. Acting on this premise, directors of Wine Institute and other prominent vintners of California decided that a national campaign should be launched to correct the abuses. The first step taken is a campaign to enroll all of the state's 600 wineries in the Institute.

J. A. HUMPHREYS

Formerly with Baird Ice Cream Co., Paterson, N. J., he has been elected executive secretary of National Association of Independent Ice Cream Manufacturers. He has had more than 15 years of experience in the industry, and he says that the business today is faced with the most vital problems of its history.

Tri-State Canners Meet; Don't Denounce ABC Labels

Reversing the usual practice, ABC labeling came out somewhat victorious over descriptive labeling at the annual meeting of the Tri-State Packers' Association, in Philadelphia, Dec. 11-12. At the meeting, attended by 350 canners, Administrator Armin W. Riley turned some of the guns of National Canners' Association upon the organization's own descriptive labeling plan. An investigation of the Canadian system made by National Canners' Association revealed that 25 per cent of Canada's women are "conscious of the meanings of quality declarations on canned foods." Mr. Riley termed this a splendid piece of advertising on behalf of grade labeling.

Grade labeling also was upheld by F. Hall Wrightson, Easton, Md. He declared that descriptive labeling "is too cumbersome" and pointed out that in his plant it would be necessary to use at least 36 different descriptions on cans. This, he said, would confuse not only the consumer, but also the canner.

The debate on labeling carried over to the closing session of the convention when a move by the resolutions committee to have the members vote on the question was defeated. Finally it was decided to make a further study of this matter.

Commenting upon the canners' code, Ralph O. Dulany, chairman of the code authority, said that 85 per cent of the national pack came from plants complying strictly with the code. He predicted that no price fixing provisions would be incorporated in the pact, and that the industry would be under code for several years, regardless of what happened to NRA.

Maurice Siegel, Strasburger and Siegel, said that most of the goods packed by several canners would fall into a substandard class if the 22 per cent water insoluble standard established for canned peas under the McNary-Mapes law is continued.

The canners selected Newlin B. Watson., R. S. Watson & Sons, Greenwich, N. J., president.

Butter Makers Recommend Cream Grading Law

At what was considered one of the organization's most interesting meetings, members of American Association of Creamery Butter Manufacturers got together in Chicago, Dec. 4. Resolutions adopted by the association reflect the problems of the trade. It was resolved to endorse the efforts of national and state government and agricultural colleges in their cream quality improvement work, and also that each member of the association definitely refuse to accept, or pay for, illegal cream. Another resolution provided that members work for better cooperation in the various states.

An important feature of the meeting was action taken toward compulsory cream grading. The cream quality committee recommended that a compulsory cream grading law be enacted in all states and that a cream sediment tester be installed in every creamery and cream station.

The butter manufacturers elected H. C. Horneman, Sugar Creek Creamery Co., Danville, Ill., president. Gilbert Guthrie, Aro Creamery Co., St. Louis, was chosen vice-president; T. A. Borman, Beatrice Creamery Co., Chicago, treasurer; and W. F. Jensen, secretary and manager.

Many Seek Package Awards; Technical Jury Named

Unusual interest is being exhibited in the 1935 package design competition sponsored by American Management Association in connection with the Packaging Exposition which will be held March 5-8, in Chicago. The number of companies entering packages in the competition will greatly exceed that of 1934, entries to date indicate.

The personnel of the two juries of award has been announced, and the judging will take place Feb. 8. The jury for the awards for distinctive merit in technical packaging development includes:

Elmer Sheets, *The Drug & Cosmetic Industry;* Alice Blinn, *Ladies Home Journal;* William M. Bristol, Jr., Bristol-Myers Co.; James Henry, E. Pritchard, Inc.; Dr. Stroud Jordan, Stroud Jordan Laboratories; J. C. Lewis, E. R. Squibb & Sons; and A. B. Shell, Hills Bros. Co.

Pointers on Beef Storage Fruit Shipping Given

Two papers of particular value to the food industries were presented at the convention of American Society of Refrigerating Engineers, held in New York, Dec. 5-7. Treating the subject, "The Cooler Storage of Beef," Dr. Arthur W. Ewell, Worcester Polytechnic Institute, pointed out that to minimize loss of weight in storage, the humidity in the room must be high, but that high humidity greatly increases bacterial growth. Mold growth, too, is fostered by the higher humidity.

Mold and bacteria may be checked by air circulation, according to Dr. Ewell, but the humidity must be less than 85 per cent. Consequently, the use of gases as inhibitors becomes important. Mr. Ewell said that investigation has shown that carbon dioxide inhibits the growth of mold and bacteria. But this method requires gas-tight storage rooms. Moreover, CO_2 makes it impossible for employees to work in the room for any length of time.

Ozone, too, inhibits the growth of mold and bacteria, and it may be used in concentrations of only a few thousandths of one per cent as compared with 10 to 20 per cent for carbon dioxide. This means that the room does not have to be gas-tight. Furthermore, men may work for an hour or more in a room containing the maximum concentration. However, the ozone decomposes and must be supplied continuously by an ozone machine. Many of the ozonizers manufactured in this country are poorly designed, Dr. Ewell said.

Dr. Ewell cited a successful commercial application of ozone in this country. The establishment concerned uses a storage temperature of 38 to 39 deg. F. and a relative humidity of 90 to 92 per cent.

A new method for protecting Northwest freight-car shipments of fruit from freezing in transit during the winter was described by W. V. Hukill, Department of Agriculture. The method comprises the employment of a 4-in. layer of water-soaked sawdust under the fruit rack. Apples and pears freeze between 28 and 29 deg., and the heat given off as the water in the sawdust changes to ice prevents the temperature from dropping lower than that under normal exposure.

Gives Hardening Room Data

Some pertinent information on methods of hardening ice cream was given out by H. A. Ruehe, University of Illinois, before a recent meeting of National Association of Practical Refrigerating Engineers. Citing the results of tests, Mr. Ruehe said that a film of still air surrounding ice cream cans and cooling coils acts as an effective insulator against heat transfer. By using forced air circulation, a 50-per cent saving in hardening time can be obtained with ice cream in 5-gal. cans in a room at 18 deg. F. Tests also revealed that painting the outside of metal containers black saves 15 per cent in hardening time with 5-gal. containers in a still-air room. There was little saving, however, when the painted cans were placed in air currents.

A study of the effect of paper containers on freezing revealed that the ice cream hardened faster in paper than in steel cans. Fiber containers were better than either paper or steel. Paper liners in 5-gal. cans increased the time of hardening less than 2 per cent in a room where the temperature was 20 deg. F.

L. J. AUERBACHER

Vice-president of Dry Milk Co., Inc., he now heads up the medical relations department of Borden Co., New York. He developed a special dry milk for babies, introduced irradiated dry milk as early as 1929 and is said to have first suggested irradiation of milk to combat rickets. He will contact the medical profession in regard to research on milk.

Conventions

JANUARY

14-15—National Preservers' Association, Stevens Hotel, Chicago, Ill. Daniel R. Forbes, 839 17th St., N.W., Washington, D. C., secretary.

14-18—National Canners' Association, convention and exposition, Stevens Hotel, Chicago, Ill. Frank E. Gorrell, 1739 H St., N.W., Washington, D. C., secretary.

14 (Week of)—Evaporated Milk Association, Chicago, Ill.

15—Southeastern Millers' Association, annual, Brown Hotel, Louisville, Ky. Gustave Breaux, 30 U. S. Trust Bldg., Louisville, secretary.

15-18—American Fruit and Vegetable Association, Annual Meeting, Palmer House, Chicago, Ill.

16—National Pickle Packers' Association, Palmer House, Chicago, Ill. Frank D. Gorsline, 105 West Adams St., Chicago, secretary.

16-17—New England Association of Ice Cream Manufacturers, Copley-Plaza, Boston, Mass. W. P. B. Lockwood, 51 Cornhill, Boston, secretary.

FEBRUARY

4-5—Potomac State Bakers' Association, annual meeting. Lee L. Robinson, Woodward Bldg., Washington, D. C., secretary.

9—National Malt Products Manufacturers' Association, annual, Sherman Hotel, Chicago, Ill. S. L. Goldman, 160 N. La Salle St., Chicago, secretary.

14—National Cheese Producers' Federation, annual, Plymouth, Wis. R. B. Melvin, Plymouth, secretary.

New Standards for Canned Fruits, Vegetables

Tentative standards of quality and condition of canned fruits for salads have been drawn up, a standard has been proposed for fill of containers for canned mushrooms and one of the standards for canned tomatoes has been tentatively revised by the Food and Drug Administration. A public hearing on these proposals will be held at the Stevens Hotel, Chicago, Jan. 18.

The proposed standards for canned fruits for salads read as follows:

"Standard canned fruits for salad are the normally colored and normally flavored canned food consisting of (1) a maximum amount of a mixture, in proper proportion, of properly prepared, matured, unblemished and uniform sized units of apricots, Bartlett pears, yellow cling peaches, pineapple and red cherries and (2) sugar solution of sufficient strength so that the liquid portion of the finished product reads not less than 18 deg. Brix."

The proposed standard for canned tomatoes is as follows:

"The fruit shall be considered as whole or in large pieces when at least 50 per cent of the total contents are retained after draining for two minutes on a sieve having two meshes to the inch. On containers of less than 3 lb., net weight, sieves 8 in. in diameter are used. On containers of 3 lb. or more, sieves 12 in. in diameter are used."

The proposed standard of fill for canned mushrooms reads:

"Packing medium is excessive in canned mushrooms when the weight of blanched mushrooms placed in the container before processing is less than 60 per cent of the weight of water which the sealed container will hold at 68 deg. F."

Spray Residue, Alcoholic Candy Closely Watched

That the Food and Drug Administration has seriously set out to eliminate from trade channels fruits and vegetables contaminated with poisonous residue from the sprays is revealed in figures given out by W. G. Campbell, chief of the administration. In his report to Secretary Wallace, he stated that more than 6,000 samples of fruits and vegetables had been examined during the year ending June 30 and that 58 consignments were seized. While Mr. Campbell says that a careful watch will be continued, he admits that conditions, so far as interstate traffic is concerned, are improving.

Special efforts of the Food and Drug Administration also are being expended in the direction of stopping all trade in chocolate candy filled with alcoholic liquor. The sale of such candy is in violation of the Food and Drugs Act, even though the Eighteenth amendment has been repealed.

Fishery Inspection Dropped

Tentative regulations covering the federal inspection of tuna and mackerel canning operations have been laid aside because of apathy on the part of West coast tuna and mackerel canners and Maine sardine canners. The federal inspection, which is provided for under the Stephens amendment to the Food & Drugs Act, is not necessary in California and Maine anyway, according to Dr. P. B. Dunbar, assistant chief of the Food and Drug Administration, because those states have inspection services.

Federal inspection in shrimp canneries has been in effect since August, and sixteen canners are either using or have applied for it.

Quick-Freeze Keeps Cheese

Three years of experiment at the University of Wisconsin have revealed that quick freezing can be applied to cheese. The procedure is to cure the cheese and freeze it in small units for distribution to consumers. Quick freezing has been found to preserve the quality of the natural cheese and holding the product in cold storage delays spoilage in the package due to mold growth, leakage of fat or change in quality.

The freezing point of the cheese ranges from 23 deg. F. to 5 deg. F. for young and aged cheese, respectively. In the tests, the cheese was frozen in a cabinet through which air at about —10 deg. F. was blown by a high-speed fan. With this method, small packages were frozen in about 30 minutes. This rapid removal of heat was found to be essential to avoid deleterious effects. Cooled to about —10 deg. F., the cheese was packed in cardboard boxes and placed in an ice cream hardening room where temperatures of 0 to —10 deg. F. were maintained. After storing for periods varying from a few days to eight months, the cheese was defrosted and judged. Storage of longer than four months proved undesirable, but shorter periods were satisfactory.

Taxes Pay Way of AAA

Through the processing taxes paid by food and other manufacturers, the AAA is paying its own way. Chester C. Davis, administrator, on Dec. 13, reported a total collection of $550,081,419 in process taxes up to Nov. 1, which is considerably larger than the $421,697,389 used for curtailing crops.

PROMOTING THE PRODUCT

NATIONAL BISCUIT CO., New York, is sponsoring a three-hour, coast-to-coast broadcast of dance music over 57 NBC stations on Saturday nights.

BORDEN CO., New York, is featuring Beatrice Lillie, famous comedienne, in a Friday-night, coast-to-coast broadcast over NBC stations to promote evaporated milk. This began Jan. 4.

INTERNATIONAL ASSOCIATION OF ICE CREAM MANUFACTURERS, Washington, has issued a catalog of advertising material offered by its merchandising council to help ice cream manufacturers increase sales.

ADOLF GOBEL, INC., New York, plans national distribution of its canned frankfurters and sausages, backed by extensive advertising.

AMERICAN DRY MILK INSTITUTE, Chicago, has prepared a study "Milk and Its Uses in the Bakery" to compare dry milk with liquid and evaporated milk.

CORN PRODUCTS REFINING CO., New York, increased its broadcast, "The Gumps," from 20 CBS stations to a coast-to-coast link of 48 stations Dec. 17.

BOOTH FISHERIES CORP. is using the radio and retail grocery and meat publications in an educational campaign to popularize canned oysters. The campaign stresses quality.

MILK distributors in Chicago recently used an 18-page newspaper supplement featuring the "consume more milk" theme, and proclaiming December milk month.

CARL MARTY & CO., Monroe, Wis., has issued an illustrated booklet "The Story of Marty Swiss," which plays up the excellence of domestic Swiss type cheese.

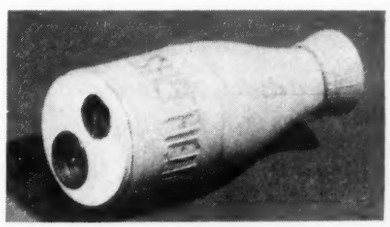
FOCKE PACKING CO., Dayton, Ohio, recently stepped up its sausage sales by setting up in the centralized food mart of the city a "German Village" where the stuffing of sausages was demonstrated and Focke products exhibited.

WINE DIET, INC., is using newspaper copy in Chicago to promote wine as a reducing diet.

WILLIAM WRIGLEY, JR., CO., Chicago, will distribute playing cards this fall and winter in a premium deal.

W. R. ROACH & CO., Grand Rapids, Mich., has gotten out a circular giving fifteen recipes for pumpkin pie, among which are interspersed slogans promoting canned foods.

GENERAL FOODS CORP. is using 28 demonstrators, salesmen and advertising men in a five-month house-to-house and store-to-store campaign in Atlanta, Ga., to promote Calumet baking powder.



SELLING THEM YOUNG

Toy milk bottle with built-in compass and pencil sharpener makes the youngsters "Sheffield" conscious.

Concentrates

WITHIN eight days after General Foods announced its employee retirement plan, 97 per cent of the eligible employees had applied for participation. . . American Association of Cereal Chemists will hold its next annual convention in Denver.

NIRB will hold a general hearing on the price-fixing provisions of codes of fair competition, at Washington, beginning Jan. 9 . . . A program proposing cream grading and grade labeling of butter has been developed by AAA for the Pacific coast dairy industry . . . A license for the California rice industry was signed Dec. 20 . . . The University of Illinois will hold its annual dairy manufacturers' conference Jan. 21-25.

THE GOVERNOR of Maine and governor-elect of Massachusetts have agreed to cooperate in restoring the fisheries of their states, now at low ebb because of importations from Japan and other countries. . . A tomato which ripens from the inside has been developed by New Jersey Agricultural Experiment Station and has been named Rutgers.

THE BEGINNING of another period of sunspot activity is indicated by observation made by the director of Ricard Memorial Observatory, which may indicate increased rainfall and plant growth. . . Eggs may be candled more efficiently before a green or blue light, according to a bulletin from New York State colleges of agriculture and home economics. . . Fruit juices stored in green glass bottles keep their original color and improve in flavor, tests at New York State Agricultural Experiment Station show.

GREAT BRITAIN and Argentina have appointed an international commission to investigate the meat packing business, including activities of four American-owned companies in Argentina. . . Russia has established a factory in Leningrad to make vitamin pills. . . The Canadian tariff board has decided that "diabetic breads and biscuits" may be imported free of duty.

THE sardine fishing industry of Algeria has organized as the "Sardinocoop" and owns a large modern cannery. . . Competition from the Philippines is hurting the California rice industry, which has established minimum prices. . . Norway's import duty on apples and pears is cut from 0.72 crown per net kilo to 0.36 crown, effective Jan. 1.

Men . . . Jobs . . . and Companies

INDUSTRY

AMERICAN PRODUCTS Co., Cincinnati, plans the addition of 40 sales branches in the larger cities, with immediate employment of some 60 executives and 300 representatives.

BENTON HARBOR (Mich.) FRUIT ASSOCIATION and the city commission of Benton Harbor will construct a $200,000 fruit storage building.

CLARKSVILLE (Tenn.) CANNERY has leased a site at Erin, Tenn., for a vegetable cannery.

COLUMBUS (Wis.) FOODS CORP. has been chartered to conduct a vegetable canning business in Texas.

CONTINENTAL BAKING CORP., New York, has been experimenting in two Midwestern cities with test campaigns to determine the public acceptance of vitamin A bread.

GENERAL FOODS CORP.'s $310,000 modernization program is under way. It affects Diamond Crystal Salt Co., St. Clair, Mich., and Postum Co., Battle Creek.

KROGER GROCERY & BAKING Co., Cincinnati, reports an increase of more than 1,000,000 lb. in the sales of cheese during the past year. Canned meat, salmon, oysters, and frozen and fresh fish also have experienced remarkably larger demands.

LIBBY, MCNEILL & LIBBY is building an evaporated milk factory in Milnthorpe, Westmoreland, England, with canning scheduled to start early in April.

MARS, INC., plans a $250,000 expansion program, including enlargement of its Chicago plant.

MINNESOTA VALLEY CANNING CO., Le Sueur, AND WISCONSIN CANNERIES, INC., Beaver Dam, are reported to be backing construction of a $150,000 to $200,000 vegetable canning plant at Montesano, Wash.

MONTEZUMA (Ga.) FROZEN FOOD Co. is conducting experiments which it believes will end the difficulties encountered in freezing peaches.

MULLER'S UNION DAIRY, Rockford, Ill., recently completely motorized its delivery system.

OMAR BAKING Co. has opened a retail store at Columbus, Ohio, for distribution, at reduced prices, of products returned by the company's trucks and wagons each day after regular routes have been covered.

ORBIT GUM Co., subsidiary of Wrigley, has been putting vitamin D into chewing gum and finds that it improves the product but is not much help in building sales.

PIONEER MAPLE PRODUCTS Co., St. Paul, operated by the Towle family which built up a big business in Log Cabin syrup and sold out to General Foods, is now pushing its new Bucket syrup by advertising.

RATH PACKING Co., Waterloo, Ia., is carrying out an expansion program involving expenditures totaling $247,000.

ROUNDSMAN FOOD PRODUCTS, INC., has been formed to take over Rounds Chocolate Co., Newton Lower Falls, Mass. Frank L. Rounds is president.

SALIVAR INC., which recently combined with Astoria (Ore.) Byproducts Co., soon will commence commercial manufacture of salmon oil from cannery wastes. It experimented two years.

SAN ANTONIO (Tex.) BREWING ASSOCIATION is carrying out a $100,000 modernization program, installing 60 steel storage tanks and new bottling machinery.

SPRECKELS SUGAR CORP., Yonkers, N. Y., may be sold at public auction, along with Syrups Products Co., a subsidiary. A federal court has ordered interested parties to show cause why this should not be done.

SWIFT & Co., Chicago, is conducting classes at its general office and correspondence courses in outlying plants to increase the value of employees to the company.

WEBER BAKING Co., Los Angeles, has perfected a method for doubling the butter-fat content of bread.

WILSON & Co., Chicago, recently completed a plan of recapitalization which will eliminate preferred dividend accumulations of $12,000,000. The plan will be submitted to stockholders Feb. 19.

PERSONNEL

EDGAR ASHBY has been elected president of Indiana Canners' Association. John B. Stokely is vice-president; J. J. Rogers, secretary-treasurer.

M. S. BANDLER has been transferred from Philadelphia to Miami to head up Southeastern operations of June Dairy Products Co., Inc.

HAROLD C. BEACH, American sales manager of George Weston Biscuit Co., has been appointed general manager of the new manufacturing plant of the company at Battle Creek, Mich. The plant will open about Feb. 1.

MARY M. BROOKE, Purity Bakeries Corp., Chicago, is the new chairman of the Midwest section of American Association of Cereal Chemists.

JAMES J. BYRNES has been appointed president of the New England division of Great Atlantic & Pacific Tea Co., with headquarters at Boston. He formerly was first vice-president of the company's central division.

GEORGE F. FONGAR succeeds Howard C. Massey as manager of the Denver plant of Cudahy Packing Co. Mr. Massey has been transferred East.

EVERETT G. GALER, who heads up the ice cream division of Dairymen's League Cooperative Association, Utica, N. Y., has been elected president of Association of Ice Cream Manufacturers of New York State.

CHARLES GEHRINGER, second baseman of the Detroit Tigers, heads up the newly formed Gehringer Candy Co., Detroit.

WILLIAM A. GODFREY, Michigan Fruit Canners, Inc., Benton Harbor, on Dec. 4 was chosen president of Michigan Canners' Association.

SAMUEL F. GORDON, St. Louis, became president of Missouri Bottlers of Carbonated Beverages Dec. 4.

B. F. HERREN has resigned as manager of Russell (Kan.) Milling Co., a position which he held for 22 years. He is succeeded by H. H. Wentworth, who was assistant manager.

CARL HERRUD, formerly of Herrud & Sons, sausage manufacturers of Grand Rapids, Mich., has been appointed manager of Honey Moon Food Products Co., a Cleveland sausage concern.

R. A. HUBER has been advanced from fifth to fourth vice-president of Anheuser-Busch, Inc., St. Louis. Aldabert von Gontard, chief engineer, becomes fifth vice-president.

W. H. HUTCHINS, for 25 years with Libby, McNeill & Libby, Chicago, retired Jan. 1. He had been a special sales representative.

CHARLES L. JONES has joined the technical staff of H. J. Heinz Co., Pittsburgh, having severed connections with Dry Ice, Inc.

HOWARD JONES recently resigned as sales manager of Rice Chocolate Co., Everett, Mass.

DR. JULIAN H. TOULOUSE

Formerly research director of American Bottlers of Carbonated Beverages at the laboratory in Washington, he has taken a position with Owens-Illinois Glass Co., Toledo. He will be engaged in research and development work in connection with glass containers for foods.

WILSON W. BROWN

He heads up the new merchandising bureau of International Association of Ice Cream Manufacturers. He has been chairman of the association's merchandising council for a year and formerly was general sales director of Southwest Utility Dairy Products Co., Oklahoma City.

W. W. SHOEMAKER

He has been appointed general sales manager of Armour & Co., Chicago. He formerly was in charge of foreign operations and supervised the departments selling canned foods, margarine, pharmaceuticals, wool, casings and hides.

HENRY A. KERSTING, secretary of Missouri Brewers' Association, has resigned, effective Jan. 1. He also quits as secretary of the brewers' code authority for the fourteenth region.

CLARENCE E. LEE recently was named manager of Greenville Mill & Elevator Co.

DR. THEODORE MARKOVITS, formerly in charge of production for Hoffman Beverage Co., Newark, N. J., has set up a New York office and laboratory and will serve as a food technology consultant. With him is Dr. M. G. Weber, formerly secretary and technical adviser to Philipp T. Wirth, Inc., and recently a food consultant at Orlando, Fla.

C. J. MENZEL, president of State Dairy Products Co., has been elected president of Missouri Association of Ice Cream Manufacturers.

P. E. MINTON, formerly with Wesson Oil & Snowdrift Sales Co., has joined the sales staff of Nulomoline Co. and will cover the Midwestern territory.

M. D. MUNN recently was named president of National Dairy Council. W. L. Cherry, D. N. Geyer and F. J. Bridges are vice-presidents.

V. T. NORTON has been made assistant to the president of Jewel Tea Co., Barrington, Ill., and T. O. Cooper succeeds him as Detroit manager. W. F. Day takes Cooper's former job as South Bend manager.

ROZIER D. OILAR sailed Dec. 15 for South America where he will spend a year supervising the installation of cottonseed-oil crushing and refining equipment.

H. MARTEN PARRY, secretary of Hecker H-O Co., Buffalo, N. Y., has resigned because of his health. He has been with the company since 1920.

C. L. ROADHOUSE, University of California, recently was elected president of American Dairy Science Association. H. A. Ruehe, University of Illinois, is vice-president.

W. S. ROUTT, Orange Crush Bottling Co., Memphis, recently was re-elected president of Tennessee Bottlers' Association.

JOHN VONEIFF, Voneiff Drayer Co., Baltimore, has been elected treasurer of the confectionery code authority to succeed Max Sobel, Chicago, resigned.

DEATHS

A. O. CASBURG, 63, Holmen (Wis.) Canning Co. and prominent in the Wisconsin canning industry for 30 years.

WILLIAM J. DOUGHERTY, 70, pioneer Florida tomato canner, at Miami.

WILLIAM W. GRAVES, one of the founders and a former vice-president of National Biscuit Co., New York, at Montclair, N. J., Dec. 13.

R. W. HILL, 78, president of Hills Bros. Coffee Co., at San Francisco. He committed suicide.

CHARLES KIENTZEL, 67, president of Kientzel Noodle Co., at St. Louis.

WILLIAM F. NEUREUTER, 65, president and general manager of Hasselbeck Cheese Co., at Buffalo, Dec. 2. He was with the cheese company more than 44 years.

WILLIAM R. REEVES, 80, for years a flour-mill operator at Greenfield, Ind., at Greenfield.

E. J. SHINGLER, SR., 70, pioneer peanut-oil manufacturer formerly connected with what is now Planters Products Co., at Donaldsonville, Ga.

JOHN E. SNYDER, 71, vice-president and general counsel for Hershey Chocolate Corp., at Hershey, Pa., Dec. 20.

W. O. STANLEY, 60, vice-president of J. F. Weinmann Milling Co. at Little Rock, Ark., Dec. 5. He was with the milling company 21 years.

EDGAR VANDERPOOL, 76, who retired recently as zone manager of Booth Fisheries Co., at Baltimore, Nov. 26.

ASSOCIATED INDUSTRIES

FIRST MACHINERY CORP., New York, has established a department for the sale of new machinery.

INDIAN RIVER REFRIGERATION TERMINAL Co. has completed a large refrigerated terminal at Fort Pierce, Fla. It includes precooling and cold storage rooms.

INTERNATIONAL FILTER Co. has appointed William M. Gross district sales manager in Ohio and eastern Michigan, with headquarters at Westlake, Cleveland.

INTERNATIONAL HARVESTER Co. has advanced A. W. Scarratt to chief engineer in charge of all automotive engineering activities.

LUKENS STEEL Co., Coatesville, Pa., has appointed Thomas T. Watson development and service metallurgist. He will be engaged in service and sales work with Nickel-Clad steel.

REPUBLIC STEEL CORP. announces appointment of the following warehouse distributors: Buhl Sons Co., Detroit; F. W. Heitmann Co., Houston; Woodward Co., Albany, N. Y.; and Steel Products Co., McKees Rocks, Pa.

REO MOTOR CAR Co., Lansing, Mich., has appointed W. Ward Mohun as special sales representative.

WILSON & BENNETT MANUFACTURING Co. has advanced Harry F. LePan to sales manager of the Western division with headquarters in Chicago.

WORTHINGTON PUMP & MACHINERY CORP. has established a Pacific Coast regional headquarters at Los Angeles.

BUSINESS TRENDS

Carloadings Advance

December has shown an advance in carloadings, contrary to the usual seasonal trend. Figures available at the month's half-way mark were 3.7 per cent above the corresponding figures for 1933, and 12.4 per cent above 1932. This increase was chiefly in grain and grain products, in so far as the food industries were concerned, with a decrease shown in loadings of livestock and miscellaneous food products.

Frost Damages Citrus Fruits

Mid-December frosts in the citrus growing regions of Florida and Texas put a different face on the prospects for oranges, grapefruit and tangerines during the early months of 1935. With damage to crops estimated as high as 50 per cent, what was to be a bumper crop became something entirely different, and most of the principal packers of citrus products withdrew from the market until conditions could be determined with some certainty. Until the new California crop becomes plentiful oranges may be relatively scarce and high, while the grapefruit pack promises to fall far short of expectation.

Farm Crop Value Rises

Final estimates for the 1934 crop year, from the U. S. Department of Agriculture, show a total value of $4,782,626,000, the highest in four years, and $668,361,000 above 1933. Increased farm purchasing power will favorably influence city payrolls, with consequent strengthening of the urban food market.

A natural concomitant of this rise in crop value is the lower net agricultural production, which the December report of the Bureau of Agricultural Economics states to be the smallest in the 16 years of available records, this in spite of the drought phenomenon of unusually large marketings of cattle.

Along with prospects for increased crop production in 1935, weather and other unforeseen circumstances permitting, because of removal of some AAA restrictions, this year prices are expected to be somewhat above those of 1934. The expected trend, therefore, is toward increase in both quantity and value of agricultural products, except that meat production will be less.

Sugar Use Still Off
Market Faces Surplus

With sugar consumption in the United States still off about 2.2 per cent from 1933, according to recent information from Lamborn & Co., the sugar market is threatened with a surplus that may depress early 1935 prices.

When the AAA, under the Jones-Costigan Act, set the sugar supply for the country at 6,472,000 tons annually, no account was taken of surplus sugar in warehouses. Add to this the fall-off in consumption, and there now is found to be some 750,000 tons available for immediate marketing. Unless the AAA revises its allotments downward for this year, or makes some other adjustment, lower prices may result.

Coffee Use Up, Stocks Off

Coffee drinkers in the United States, who now use just over one-half of the world production, in the fiscal year ending June 30 raised their consumption for the first gain in ten years. In October, coffee deliveries in the U. S. were the largest for the month since 1924. November consumption was 987,819 bags, against 963,451 in November, 1933.

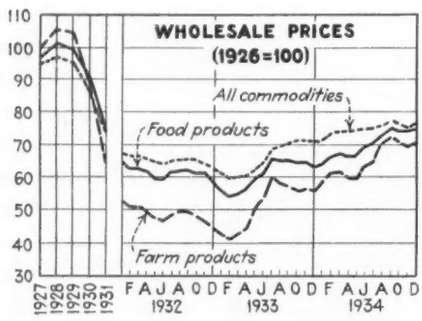
In contrast to these figures, world use of coffee is off about 7 per cent and the visible supply of coffee, exclusive of restricted stocks in Brazil, has fallen by 3.4 per cent, to 6,819,803 bags, only slightly over three months' supply for the United States.

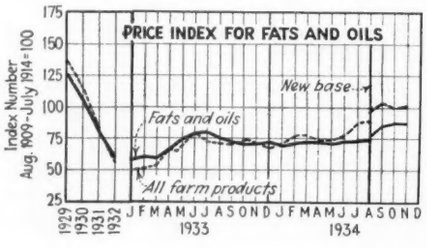
Outlook for Wheat

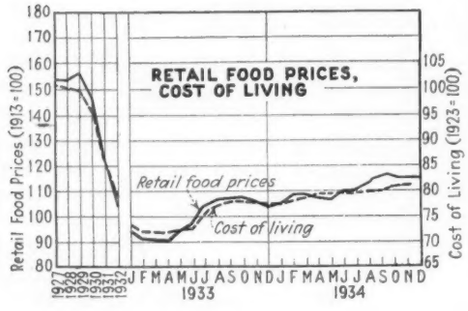
General conclusions reached from what is now known as to 1935 world wheat prospects, exclusive of Russia, indicate that the general trend toward acreage reduction in wheat exporting countries other than the United States will continue. In the wheat importing countries of Europe the trend toward

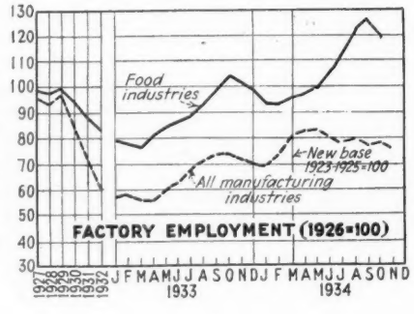
Construction News

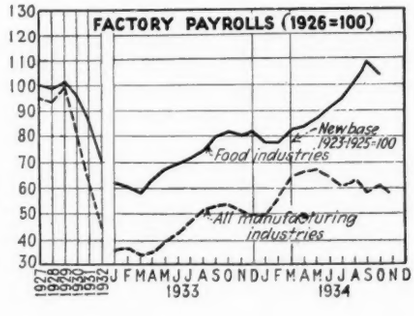
	Pending (thousands)	Awarded December (thousands)	Total Awarded 1934 (thousands)
Bakery	$99	.....	$899
Beverages	704	$105	8,450
Canning and Preserving	30	.....	1,200
Confectionery	.....	.....	133
Grain Mill Products	886	500	4,586
Ice, Manufactured	30	.....	87
Meats and Meat Products	28	.....	1,377
Milk Products	110	269	1,982
Sugar	.....	.....	105
Miscellaneous	225	231	1,855
Total	$2,112	$1,105	$20,674




PRICE INDEX FOR FATS AND OILS
Index Number Aug. 1909-July 1914=100
New base
Fats and oils
All farm products
1929 1930 1931 1932 1933 1934







BASIS FOR THE CURVES

Retail food prices, factory employment, factory payrolls and wholesale prices based on indexes of the Department of Labor. Cost of living index is that of the National Industrial Conference Board. Indexes of prices of fats and oils, and of all farm prices are from the U. S. Department of Agriculture, as are the per cent of parity prices.

Business Jubilant

AFTER five months of decline and buffeting about by drought, wrangling over code administration, labor disorders, price fluctations, political juggling and wishful thinking, business suddenly broke into a feverish state of activity that continued through the Christmas holidays; as though trying to make up for lost time.

WITH commodity prices holding at the same or slightly higher levels the volume of retail buying for the past month is reported to have passed that of 1933 by more than 16 per cent. Production and delivery had to be speeded up to keep retail outlets supplied to meet last minute buying demands.

THE *Business Week* index of general business stood at 61.9 per cent of normal for the week ending Dec. 22; an advance of 6.36 per cent since Nov. 17 but 7.20 per cent below the Dec. 16, 1933, figure.

WHOLESALE PRICES reported by U. S. Department of Labor showed practically no change for the month ending Dec. 22; for the year all commodities were 8.95 per cent higher, prices of farm products were boosted 29.74 per cent and food advanced 22.40 per cent.

NEW YORK *Journal of Commerce* in its weighted price index reports an advance of 3.17 per cent in general index; a 2.02 per cent increase in price of grains, and 11.63 per cent in food prices for the five weeks ending Dec. 29. For the year the general index jumped 10.61 per cent; grains 50.41 per cent, and food 34.37 per cent.

THE YEAR ENDS with business away to a running start for 1935.

acreage increases that started several years ago has not run its course. In the United States, an exporting country, artificial control by AAA will keep the exportable surplus down, but something over 150,000,000 bushels for export is looked for by the Bureau of Agricultural Economics.

Winter wheat plantings now promise a yield of 475 million bushels, 75 million above 1934, but 157 million bushels below the 1927-31 average, from an acreage increased by 5.9 per cent over that planted a year ago. The combined acreage of winter and spring wheat for the crop of 1935 is now put at 62,700,000 acres, compared to 58,700,000 acres last year.

Just what the yield will actually be from this sown area will depend upon the carry-over effects of the 1934 drought and the rainfall and weather this year. If nothing unforeseen happens, and the export surplus is near that now predicted, domestic wheat prices may be expected to decline somewhat, but to remain well above the world level.

More Wines From Europe

While American viticulturists are planning to decrease their acreage of juice grapes and increase their production of table grapes, because of unsatisfactory prices for the former, European growers report a bumper production of the wine varieties. This is particularly true of France, where an unusually large crop of excellent quality is reported.

While these facts will have no immediate effect on American wine supplies, the trend indicates that a larger proportion of imported wines may be expected to enter American consumption within three or four years.

Butter Importations Possible

For the moment. the trend toward an increase in the spread between domestic butter prices and prices in the world market seems to have been checked, having reached the point where importation from New Zealand and other butter exporting countries seemed likely, with domestic prices almost high enough to cancel the 14 cent import duty. Stocks in storage remain high, well above the five year average, although smaller than a year ago. The world price situation is influencing domestic levels more than conditions of supply and stocks.

Dried Fruits Steady

Firm price levels exist for dried fruits, based on practical disappearance of carry-over supplies from the old crop and the effect of the holiday trade. Packaged goods are experiencing better demands, because of the relatively high price of bulk fruits, particularly rasins, prunes and apricots. Dates and figs are in good demand. Incidentally, the Bureau of Agricultural Economics reports that exports of prunes, which totaled 97,000 tons last year, will be considerably less, since Germany, with 18,000 tons on hand, is not expected to buy much of the new crop.

INDICATORS

SNAP BEAN pack in 1934, of 6,300,362 standard cases (24 No. 2), was larger than the 1933 yield, although almost 200,000 cases below the five-year average.

FLORIDA freeze in December almost completely ruined the winter crop of such tender vegetables as beans, peppers, tomatoes, peas and egg plant.

MEXICAN vegetables promise to be more plentiful in Northern markets this winter, as the acreage planted in Sonora, Sinaloa and Baja (Lower) California has increased.

CUBAN vegetable crops, mostly for export to the United States winter market, are from 20 to 25 per cent greater than in 1933.

EXPORTS of American apples have fallen off some 500,000 bushels or 20 per cent this year, as compared to 1933, while pear and grape exports increased about 10 and 50 per cent, respectively.

FEED GRAIN production throughout the world decreased in 1934, though not as much as in the United States, barley being off 6 per cent from 1933; oats, 17 per cent; and corn, 31 per cent.

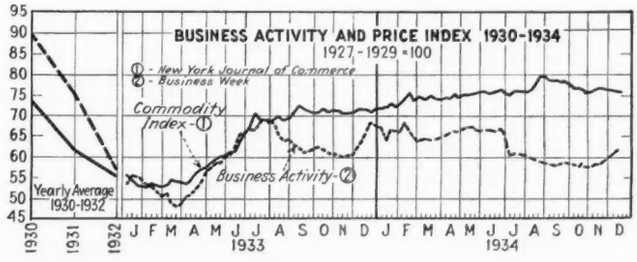
SARDINE packing in Maine has returned to normal, after ten years. F. P. Washburn, State commissioner of agriculture, finds that the 1934 pack will be 1,250,000 cases of 100 cans, an increase of 500,000 cases over 1933.

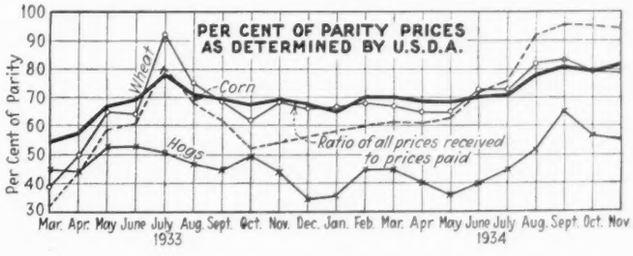
BEET-SUGAR growers who sign production contracts will be guaranteed a price of approximately $6.77 a ton for the 1935 crop, according to an AAA announcement.

JAPANESE canning of fish, meat, fruit and vegetables is rapidly increasing and exports of these products to Great Britain, France and the United States are assuming respectable proportions.

FRESH EGG receipts, expected to gain sharply in December, have not yet come up to the anticipated level, with the result that the egg market has become firmer, although storage supplies are normal.

GRAIN RATES revision by I.C.C. applies generally in the West and Southwest on traffic in those sections, traffic moving beyond, and export traffic; will leave flour rates nearly the same but increase rates on cereal preparations.





PATENTS

Drying Fruit With Revolving Brushes in a Current of Air—Frank B. Roberts, Anaheim, Calif., to Food Machinery Corp., San José, Calif. No. 1,981,197. Nov. 20, 1934.

Treating Powdered Dry Yeast With Smoke to Remove Natural Yeast Taste—Curtis P. Freshel, New York, N. Y. No. 1,981,225. Nov. 20, 1934.

Separating Wheat Germ From Particles of Bran and Endosperm—Thomas R. James to General Mills, Inc., Minneapolis, Minn. No. 1,981,318. Nov. 20, 1934.

Continuous Method of Removing Hulls From Cereal Grains—Albin Barra, Danzig. No. 1,891,409. Nov. 20, 1934.

Preserving Food Materials in Container by Subjection to Secondary X-Ray Radiation—Palmer H. Craig, Cincinnati, Ohio, to Invex Corp. of New York. No. 1,981,583. Nov. 20, 1934.

Refining Crude Cottonseed Oil by Heating With an Anhydrous Solid Ester of Boric Acid—Max Schellmann, Mannheim, Germany to I. G. Farbenindustrie Aktiengesellschaft, Frankfurt-on-the-Main, Germany. No. 1,981,605. Nov. 20, 1934.

Ice Cream Cone Making Machine—John P. Gorset and Christ J. Halset to Ideal Machine Co., Chicago, Ill. No. 1,981,862. Nov. 27, 1934.

Treating Cheddar Cheese Preliminary to Wrapping in Foil—Linda C. Brulin, Auburndale, Wis. No. 1,981,986. Nov. 27, 1934.

Increasing Vitamin Content of Food With "Soft" X-Ray Radiation—George Sperti, Covington, Ky., to General Development Laboratories, Inc., New York, N. Y. No. 1,982,028. Nov. 27, 1934.

Sterilizing Food Products and Increasing Vitamin Content by Irradiation with Ultra-Violet Light Without Injury to Taste, Smell or Color of Food—George Sperti, Covington, Ky., and Robert J. Norris, Robert D. Withrow, and Herman Schneider, Cincinnati, Ohio, to General Development Laboratories, Inc., New York, N. Y. No. 1,982,029. Nov. 27, 1934.

Frying Fat Containing a Small Percentage of Licithin and Method of Making It—Earl B. Working, Tucson, Ariz., to American Lecithin Corp., Atlanta, Ga. No. 1,982,186. Nov. 27, 1934.

Method of Conditioning Spinach for Canning—Earl R. Anderson, Los Angeles, Calif., to Food Machinery Corp., San José, Calif. No. 1,982,944. Dec. 4, 1934.

Bacillus Acidophilus Cultured Soy-Beam Milk—John Harvey Kellogg, Battle Creek, Mich. No. 1,982,994. Dec. 4, 1934.

Spray Drying Molasses—Theodore Black and Jack Drew to Molaska Corp., Cleveland, Ohio. No. 1,983,434. Dec. 4, 1934.

Processed Mix of Fudge-Type Confectionery Dried to Powder Form to be Reconstituted Without Subsequent Creaming—Reed W. Robinson and Andrew Olsen, Jr., San Francisco, Calif. No. 1,983,568. Dec. 11, 1934.

Freezing Food Products in Measured Volume Units—Bicknell Hall, Gloucester, Mass., to Frosted Foods Co., Inc., Dover, Del. No. 1,983,754. Dec. 11, 1934.

Automatic Grading and Packing of Eggs by Weight—Charles Nathaniel Barton, Wimbledon, London, England. Nos. 1,983,892, and 1,983,893. Dec. 11, 1934.

Production of Vitamin D Content in Food by Subjection to Low Velocity Cathode Rays—August J. Pacini, to American Research Products, Inc., Chicago, Ill. No. 1,983,944. Dec. 11, 1934.

Method of Delivering Chocolate to Centers in a Sheet Having the Thickness Desired on the Centers—George Ralph Baker and George Donald, Willesen Junction, London, England, to Baker Perkins Co., Inc., Saginaw, Mich. No. 1,984,009. Dec. 11, 1934.

Smoking Frankfurters at 125 Deg. F.; Then at 145 Deg. F.—Floyd Seaver to Swift & Co., Chicago, Ill. No. 1,984,435. Dec. 18, 1934.

Preparation of a Chocolate-Flavored Fat Emulsion—Daniel A. Farrell, to John F. Jelke Co., Chicago, Ill. No. 1,984,470. Dec. 18, 1934.

Cooling and Aerating Milk in Standard Milk Cans—Linus Johan Reinhold, Hasselberg, Krapperup, Sweden. No. 1,984,581. Dec. 18, 1934.

Machine for Forcing Sticks Into Frozen Confections—Rudolph G. Birr, Lombard, Ill., to Precision Metal Workers, Chicago, Ill. No. 1,984,724. Dec. 18, 1934.

Removing Vitamin-Containing Fractions From Oils and Fats—Charles L. Barthen, South Orange, N. J., to Health Products Corp., Newark, N. J. No. 1,984,858. Dec. 18, 1934.

Systematic Plant Maintenance

(Concluded from page 10)

many times over and prevents many headaches.

But no matter how good the plant man is (he may be a crackerjack) the job of plant maintenance and operation is too important to be left to his memory or to depend upon any casual inspection of the various units. A plant engineer should check up on his equipment and supplies at stipulated intervals against a proper maintenance schedule.

For just such purpose the Windsor City Dairies, Ltd., Windsor, Ontario, has worked up a manual known as "Operating & Maintenance Schedule for Ice Cream Manufactory." In its present form this manual is a 95-page loose-leaf compilation of information concerning the plant and equipment. It is divided into seven sections: (1) General Building Maintenance, (2) Refrigeration Installation, (3) Electrical Installation, (4) Heating Installation, (5) Plumbing Installation, (6) Manufacturing Equipment, (7) Plans of the plant.

Structures and equipment units pertinent to each division are listed, identified by manufacturer and by whom installed, and described as to construction details, operation, maintenance and manufacturer's catalog number for replacement. Where obtainable a manufacturer's catalog bulletin or instruction sheet for each unit is included. Detail drawings, floor plans and specifications, elevations, cross sections and bill of material schedules are included, even to the details of alterations and additions.

This manual is contained in a serviceable flexible-leather ring-type binder and by the insertion of additional loose-leaves can be kept strictly up-to-date.

The work of a plant engineer covers a broad field and one can not expect him to be an expert in every branch of the complex set-up he has in charge. Occasionally one finds plant engineers who can give lengthy lectures on what they know about mechanics and some almost claim to be masters in thermo-dynamics. No such high-powered experts are needed. Too often plant engineers are oilers or handy men who after years of observation and experience with various forms of equipment prove themselves more or less capable of operating a plant. Some of these men are rather expert with steam boilers, or refrigeration, for instance, but have a very limited knowledge of the manufacturing or the electrical equipment. Others may be machinists who were experts in repairing equipment but whose understanding of the operation of generating units such as steam, refrigeration and the like is rather vague.

Should an employer be plagued with such a plant engineer and not realize it, the adoption of an operating and maintenance manual would show whether he is on the job or not.

From our experience in plant construction and maintenance work we could cite many instances where ignorance, carelessness, lack of systematic inspection or maintenance follow-up work or laziness have been responsible for mishaps, major repair jobs, or damage to goods in process.

One wouldn't think of running his automobile without having it serviced by a dependable service man, one who refers to an authentic chart to determine the type of oil or grease the car needs during the particular season. Such periodic servicing entails some expense but it is considered good business and in the long run saves the owner money.

The same reasoning logically applies to the taking care of plant buildings and equipment. Let me emphasize again that the efficiency of a plant cannot be attained automatically through the medium of a good layout or first-class installation of equipment and machinery. Plant operations are jeopardized unless a thorough and periodic system of maintenance is established. The adoption and use of an operating and maintenance schedule or manual is one of the surest ways of getting a systematic checkup on plant maintenance and equipment condition.